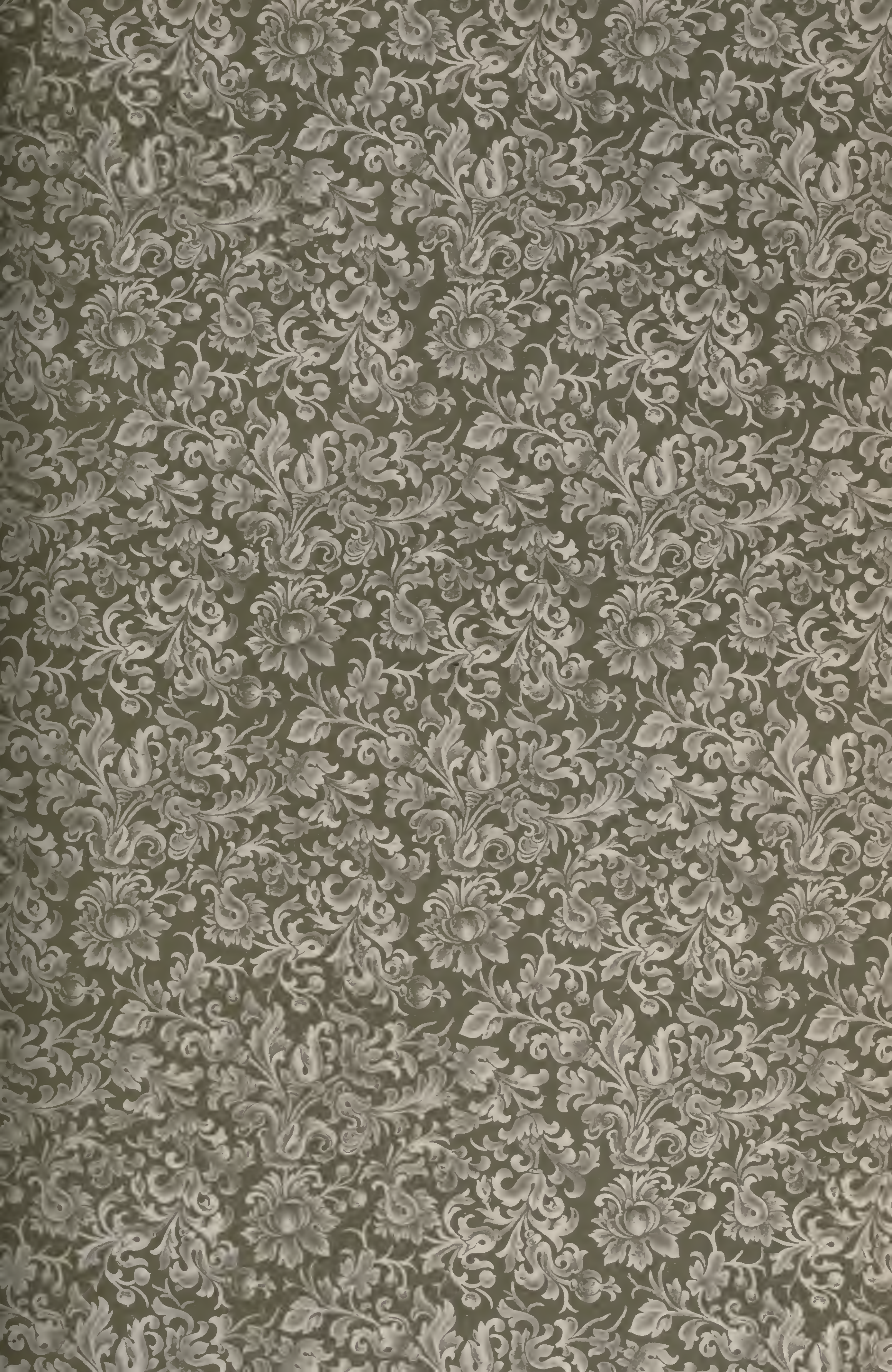

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ORIGINAL COMMUNICATIONS.

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SOME CLINICAL OBSERVATIONS IN INTRACRANIAL COMPLICATIONS OF OTITIC ORIGIN.*

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To attempt to discuss all the intracranial lesions of otitic origin, would be unwise and impractical because of the time it would require, and my lack of experience in dealing with many of them. Hence I have taken the liberty of changing the topic assigned me, so that I may present only those phases of these complications which I have met with in my own practice. The general discussion which is to follow the other papers on the programme will consider probably all the forms of intracranial complications resulting from otitis media, and in this more practical way will the entire subject be brought before the Academy. The topic is too important and time too short to attempt to bring before you a résumé of the literature of the subject. We gain more from the recital of individual experiences than from lengthy dissertations and conclusions drawn from others. This is a great American Academy, where each gives the other his personal Academic clinical experience learned at the bed side and operating table and often verified in the post mortem examination.

It is said that the father of otolgy, Professor Adam Politzer, in his introduction to his annual lectures on otology, takes up the temporal bone, and holding it in full view of the class of students, slowly and forcibly tells them:

The temporal bone has four sides, the outside is bounded by life, from which there comes through the opening of the external auditory canal one form of our appreciation of what life means; on the other three sides, this bone is bounded by death.

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*President's address before the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., September 26, 27 and 28, 1907.

There is much truth and pathos in this statement especially when intracranial lesions are the result of a diseased condition of the temporal bone. But the dangers of years ago, when this grand old otologist first uttered these words, are being rapidly overcome by the advance of the medical and surgical science of today.

The only intracranial lesions of otitic origin I have met with are meningeal iritation (meningism), meningitis, extradural abscess and cerebral abscess involving the spheno-temporal lobe, and the lessons learned from these cases lead me to the discussion of the topic.

CASES OF INTRACRANIAL LESIONS OF OTITIC ORIGIN.

The number of cases which I have observed and whose histories have been recorded, is twenty-four, and each case was characterized by marked meningeal and cerebral symptoms, which operation revealed were of otitic origin or complication. They were not of that class, so often found in doing the mastoid operation, which had not previously given any symptoms of intracranial lesion. Of this number, seventeen of the patients were operated on, ten of whom recovered. In seven others, all the symptoms were improved by the operation, for from one to five days; three cases were meningism as described by Chevalier Jackson, which were of otitic origin.

In the seventeen cases operated on, one or several of the following conditions were found:

Two cases of abscess of the spheno-temporal lobe.

Five cases of extradural abscess in the middle fossa.

Four cases of extradural abscess in the inferior fossa.

Three cases of serous meningitis in which dark colored fluid was found under considerable pressure between the bone and dura in the middle fossa.

Eleven cases in which the tegmen tympani and antri were destroyed and the dura thickened (pachymeningitis).

Six cases in which the sinus was exposed; two were opened in removing the granulations covering them.

Two cases in which the facial ridge was eroded, exposing the nerve, temporary palsy resulting.

Five cases in which there were fistulous openings in the tegmen tympani.

Six cases in which there was optic neuritis (in both the spheno-temporal abscess cases and in four cases of extradural abscess in the inferior fossa.)

Four cases were due to acute otitic media.

Thirteen cases were due to a chronic otitis media.

In none of my cases was there a lateral sinus thrombosis or cerebellar abscess. Seven of the patients died without operation, and seven died who were operated on. Of the latter, I was able to obtain autopsies in six, two of which showed tubercular meningitis, with the center of infection over the area of the tegmen tympani of a chronic suppurative otorrhea; three were diffuse purulent meningitis, one was diffused meningitis with suppuration of the Gasserian ganglion complicating double mastoiditis. Since operation on intracranial lesions has proven to be life-saving, the interest of the otologist and general practitioner has become more active in these patients.

In the ordinary neglected otorrhea, swarms of micro-organisms are found, both saprophytic and pathogenic. The mere chronicity of an otorrhea without extension of serious disease is no guarantee to the individual of future immunity. Patients so affected, are at any time liable to the rapid onset of dangerous sequelæ, which may arise from fresh inoculations of the discharge in the middle ear, or from exposure of fresh area of the membrane brought about by progressive disintegration, and the implication of these fresh areas in the pathogenic process.

Chevalier Jackson says:

> To look over the text-books and the periodical literature, one would suppose that the only pyogenic extension of purulent otitis media was by way of the mastoid cells. Yet we all see cases of intracranial extension through the tympanic roof. Are we then justified in considering mastoid empyema the only indication for opening the mastoid? Are we not culpable when we fail to advise and urge early operation on our patients with chronic otorrhea who are carrying about a foul discharge, offensive to their companions, rejected
> ies, and perhaps living in dread of an operation
> y come to sooner or later? The risks of opera-
> nil; the risks of postponement are great. To
> te pyogenic invasion has affected the arachnoid,
> ids, while not a forlorn hope, is hazardous, and
> recoveries reduced to more than one-half by the

IS OF INTRACRANIAL COMPLICATIONS.

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tion, as manifested by persistent headaches, ver-

tigo, vomiting, somnolence or irritability, the radical operation should be performed, the dura exposed, examined, irrigated and drained through the tegmen tympani and antri.

It matters not whether there exists symptoms of mastoid infection. If the middle ear shows evidence of infection or there is a history of chronic suppuration having existed, I believe it best to advise immediate operation,

The infection most frequently takes place through fistulous openings in the tegmen or the walls of the temporal bone towards the dura and sigmoid sinus. Infection less often occurs without any demonstrable lesions in the bone, by means of the numerous anastomoses between the blood and lymph vessels of the cranial cavity. (Politzer).

In some of my most pronounced cases of intracranial disease, no pus was found at the operation and no evidence of active trouble existed in the tympanic cavity at the time, but the tegmen of the antrum, attic and tympanum were covered with granulations and the bone was soft and soggy, and gave the sensation more of cutting through wet chalk than through bone.

I am convinced, as pointed out by Körner, that in the early stage of infection of the basal meninges, inflammatory edema may produce the same symptoms as observed in extradural abscess. In three of my patients who recovered, extradural abscess of the tegmen associated with compression of the overlying temporal lobes and the cerebral injection was disproportioned to the extradural lesion. While there was in these cases no recognizable abnormality of the intervening arachnoid, by mere contiguity without plastic exudate, the infection had passed through and red softening had begun, which in a few days more would have formed a spheno-temporal abscess. In such cases, early operation in which free dainage is given and the infected area thoroughly irrigated, gives promise of favorable results.

The five extreme cases in which the patients recovered add increasing emphasis and hope to the plea for early operative interference in the class of cases under consideration, and I quite agree with Randal and others in the contention that in these cases and also in those of tuberculous meningitis the patients ought to be operated on and irrigation with warm physiologic saline solution practiced. In only three cases have I used lumbar puncture, and I am not sure that appreciable benefit resulted. In cases of serous meningitis, I shall continue to resort to it, but am convinced that drainage and irrigation through the middle fossa is the better treatment. I have washed away quantities of purulent exudate in some of my fatal cases, and though too late to avail more than temporary relief, I am sure the procedure was correct.

Cases I have met with have been few and of the more simple form of intracranial disease of otitic origin, and some of them are open to question, but I am convinced that the suggestion of operating early, is the safer to follow and I have reason to believe that had I not waited so long in my first series of cases, and had my technic been better, the results would have been different.

To operate on a patient who will certainly die is a discredit to otology, and prevents or delays consent in other operable curable cases. To operate on a child whose symptoms are due, not to the extension of its ear disease, but to the toxemia of an acute infection, is to make a grave mistake. To fail to operate in a case of operable, curable mastoid or middle ear disease which is producing grave symptoms, is a fearful error. (Jackson).

To all of which I agree, but in this age, what excuse can there be for allowing a patient, except in very rare instances, to become hopeless before giving him the chance that only surgery can give?

I believe many of the hopeless cases and fatal results are due to delay and halting between two opinions. In these cases, everything is to be gained and nothing to be lost by the operation, and if the end is hastened a few hours and made easier by the operation, both relatives and attendants have the consolation of the knowledge, that all was done that could be. A forward step will be taken when our patients are taught this and also the wisdom of an autopsy whenever there is a reasonable request made. It is only in this way that the people and the profession will be made safer than they are now.

It must be remembered that there is such a difference in the contour and structure of the epitympanum and the mastoid as to justify the assertions that there is no bony structure in the human body which presents so many deviations from an arbitrary standard type as the normal epitympanum and mastoid process of the temporal bone. The same multiplicity of variations is found on the inner walls separating the mastoid from the cranial cavities.

It is also true that in intracranial complications of otitic origin, the definite symptoms of their existence unfortunately are either conspicuous by their absence or fallacious as to their significance, while the general condition of the patient may be such that the main localizing symptoms are incapable of demonstration. Especially is this true in cases of cerebral or cerebellar abscess. An exact diagnosis as to the location is often impossible and more than one operation may be needed before the desired results are attained. In epidural abscess there frequently are no general symptoms of meningitis, nature walling off the area of meningeal inflammation from the cranial cavity and often thus effecting a spontaneous recovery.

In the cases of extradural abscess seen by me, all but three were epitympanic, the others were in the posterior fossa and were the only ones giving evidence of threatening serious brain trouble before the operation, these being of size and virulence sufficient to produce pressure and toxemia. In the former cases, there was no destruction of the bony walls bordering on the dura, the infection having taken place through a fistulous perforation in the wall. Had the bony roof of the tympanic and antral cavities been destroyed by the pathologic process, pus could not have collected between the dura and the bone.

Of course the more marked the symptoms of intracranial complications, the more urgent is the indication for operation. My own observations justify the conclusion, however, in cases of otitic disease whether acute or chronic, that symptoms of meningeal irritation are indications for immediate operation. Such symptoms are characterized by headache, photophobia, pain over the entire temporal bone, especially above the back of the ear, whether there be evidence of mastoid disease or brain pressure, with drooping eyelids, furred tongue and loss of appetite, slow pulse and sluggish pupils. Other brain symptoms such as somnolence, dizziness, vomiting, optic neuritis and nystagmus may occur associated with an extradural abscess, yet the appearance of these symptoms is not to be relied on for making a differential diagnosis.

Operative procedure need not subject the patient to greater dangers than already exist, and therefore can be undertaken before the advanced stages of meningitis have set in. As in threatened serious abdominal disease, appendicitis and peritonitis, immediate attempts are made to eliminate the primary focus of infection, so in the treatment of otitic meningitis, our aim should be to eradicate the primary suppuration in the temporal bone.

THE RESPONSIBILITY OF THE GENERAL PRACTITIONER.

Only recently has otology received the full recognition it deserves and the general practitioner who holds in his keeping the present and future health and hearing of his patients, is just beginning to awaken to his responsibility—of warning them of the necessity of the most careful and scientific treatment in the nasal and accessory sinuses. When this branch of the medical profession is aroused, we will have fewer cases of deafness and intracranial disease.

It is the province of the general practitioner to warn parents of the danger of delay in having their children with nasopharyngeal disease, especially adenoids, or earache, promptly attended to. On his shoulders too, rests the responsibility of early recognizing the first evidence of intracranial irritation. The class of cases under consideration is seen first by him, and when the otologist is called, they have usually passed beyond the initial stage, and the alarming symptoms of meningeal irritation or inflammation are present. It is often impossible to state with any assurance, what the symptoms indicate, whether a serous meningitis, pachymeningitis or a leptomeningitis.

The one fact that now confronts parents, friends and medical attendants, is that the enemy is on them, and no enemy of the human body strikes with greater force and horror than the mention of meningitis or brain disease. The question now is not so much what phase of intracranial disease we have to contend with, but what shall we do? We are assured of the fact that unless the condition that exists is speedily brought to an end the patient has everything to gain and nothing to lose by our most heroic efforts.

If the well-known and accepted symptoms of the disease exist and there is evidence of suppuration in the ear, or history of previous suppuration, with vertigo, the two things to be done promptly and thoroughly are: First, to start vigorous elimination by purgative diuretics and diaphoretics, and these failing to relieve in a few hours, second, to drain the middle fossa through the tegmen tympani and antri after doing a radical exenteration of the tympanic cavity and mastoid cells.

We lose valuable time and handicap our profession by waiting for differential points of diagnosis. Undoubtedly intestinal toxemia begins early in all ear disease, and I know of nothing that so completely interferes with peristalsis resulting in obstinate constipation, as does pain in the ear. Here the vicious circle is started, in which we have first constipation followed by faulty and perverted intestinal metabolism, disordered innervation, the urine being loaded with indican, with the result that marked evidence is shown in the toxic condition of the patient. This is no time or occasion for small doses frequently repeated or exploratory punctures; something radical is demanded from both a therapeutic and surgical standpoint. This is an occasion when in the very beginning we must hasten the results of our efforts, especially from the therapeutic standpoint.

THE INITIAL TREATMENT.

My rule is to start active purgation with one large dose of calomel, five grains for a child under four years of age and ten to twenty grains for those older. Give the full dose not only for its purgative, but for its antiseptic and sedative effect, to be followed in six hours by one ounce of castor-oil, which is to be followed two hours later by one ounce of sulphate of magnesia. If the results of those do not indicate that the alimentary canal is empty and clean, a colon flush is given.

No nourishment is given but milk or broth every three or four hours, and not then if objected to by the patient. This treatment will assist materially in determining whether we are dealing with a meningeal irritation due to toxemia from the ailmentary canal, or whether the chief source of the trouble is elsewhere. In either event, it is the best preparation for any operative procedure that is to follow. If the meningeal symptoms are unmistakable, I do not think it wise to wait for the effect of drugs on the eliminative organs, but give the calomel just before starting the anesthetic and hasten its action as soon afterward as possible.

In several instances where the patient was unconscious and in convulsions, the calomel was given after placing the patient on the operating table, the preparations for the operation being done during the administration of the anesthetic. In five cases where the symptoms of meningeal irritation and brain pressure were most marked and the cases seemed hopeless as far as any treatment was concerned, this procedure of free elimination, drainage and irrigation, resulted in the recovery of three out of the five.

In none of my cases were the meningeal symptoms increased by the operation, and I am convinced that early operation is less dangerous than waiting for an exact diagnosis. Macewen's record of nearly eighty per cent of recoveries in cases operated on for intracranial lesions, stands unparalleled. He, with Jansen, Herman, Heine, Ballance, Körner, Lane, and other well known Europeans, operates at the first evidence of the extension of the infection to the intracranial cavity.

I know of no branch of surgery in which adequate hospital equipment, where trained assistants who are familiar with the technic of the operator counts for more, than in surgery of the cranial cavity. It is here that the "team work" and "system" so prominently brought out by the Mayo brothers are of paramount value. It is here that the anesthetist, operator, assistant, and nurses, are to understand thoroughly and do his or her part without loss of time or friction. The minimum amount of anesthetic is to be used, and in certain parts of the operation, practically none is given; the minimum amount of laceration and bruising of the soft parts, concussion and jarring done away with by substituting Kerrison's forceps and rongeurs for the chisel and mallet.

The use of the hot physiologic saline solution of a temperature of 115° to 120° F. from a fountain syringe, keeps the field of operation clean, controls hemorrhage and keeps the dura warm and moist, as advocated by Sir Victor Horsley; the careful sponging with gauze wrung out of hot sterile saline solution, to avoid bruising the delicate structures.

In a word, success largely depends on the thoroughness with which the operation is done, with the minimum amount of anesthesia, traumatism and shock, and the most careful sustaining of the eliminative and recuperative powers of the patient. In these cases, an excess of indican in the urine is more to be feared than the presence of small quantities or albumin or sugar, so far as the ultimate results are concerned, and more is acomplished in the first twenty-four hours by giving physiologic saline solution per rectum or by hyperdermoclysis, than by giving milk, broth or any other form of nourishment.

In conclusion I would urge that the key-note of the otologist dealing with intracranial lesions, be: Operate early; and I believe that the otologist is the one to do the intracranial surgery resulting from infection from the ear.

Starr says, "It is an unfortunate fact that less attention has been paid to brain surgery in this country than it merited. Whether this statement is all true, I am not prepared to say. If it is, it is a reproach to American surgeons, but not so great a one as waiting for external evidence of pus formation in the mastoid or alarming evidence of septic absorption or intracranial infection before operating.

Of this, however, I am quite convinced, as I stated at our last annual meeting, that in the domain under consideration, "there is much timber, tall and uncut," much food for thought and labor much anatomic and physiologic work to do, and a still greater field for study in the pathologic realm. Laurels and gratitude await the patient, persevering and courageous investigations of our members as to the diagnosis and treatment of intracranial complications of otitic origin.

A BRIEF CONSIDERATION OF THE PYOGENIC DISEASES OF THE BRAIN OF OTITIC ORIGIN.*

BY JAMES F. MCKERNON, M. D., NEW YORK.

In considering the pyogenic lesions of the brain of otitic origin, I can only give you my own clinical experience in the cases which properly come under this heading. Should there appear in various parts of this paper what might at first seem suggestions foreign to the subject, I can only say that to me they play no small part as etiological factors in its development.

No department of modern surgery has surpassed the advance made in the treatment of the brain complications of otitic origin. This is due to the fact that more accurate observations have been made at the bedside by a closer study of the symptoms presenting, by calling to our aid the laboratory worker and by a careful study and inspection of autopsy specimens. The knowledge thus gained has enabled us to make earlier diagnoses and, by instituting proper surgical procedures, to save a great number of lives.

When we realize that fully 37 per cent of all cases of brain abscess are a direct result of an extension of an infective process from the middle ear and that of this number more than four-fifths are caused by a middle-ear suppuration, it is not difficult to comprehend how important it is to treat this condition in order that structures adjacent to the middle ear may not become involved.

This is one of the special etiological factors in the production of brain lesions of otitic origin, of which I wish to speak more fully.

When a patient consults his physician about an otorrhea of long standing, the doctor is very apt to instruct him to syringe his ear with some kind of antiseptic solution two, three, or four times a day, as the case may be, without even having examined the canal and middle ear to discover to what cause the discharge may be due. Or again the patient or the patient's parents—if the patient be a child—are told that it is a good thing for the ear to discharge, and that nothing must be done to prevent it, as it is nature's method of ridding the system of an impurity, and that when the discharge ceases the ear will be cured. Unfortunately, it all too frequently happens that when such a discharge does cease, it is because the drainage from the middle ear has become obstructed and the pus that was making its appearance at the meatus has been diverted into another channel and is already affecting the mastoid bone or one or more of the intracranial structures. It is the physician's first duty when consulted by these patients to determine whether or not a necrotic process is present in the middle ear as the cause of such a discharge, and if upon examination dead bone be found, the patient or his parents should be apprised of the risk he runs if this process is left to continue unchecked. It is much wiser if the patient be made to accept the responsibility of the future outcome of the case, provided operation is advised, and refused, than that the physician be censured later for not having communicated the fact to him. It is not a difficult matter for the family physician to make these aural examinations when first consulted by these patients, and if this is done the future of many a patient will be placed on a comparatively safer plan than when it is omitted.

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*Read by invitation at the 13th Annual Meeting of the Academy of Ophthalmology and Oto-Laryngology, at Louisville, Ky., September 26th, 1907.

To demonstrate how an infective process can travel from the middle ear and affect other structures, I show you a temporal bone in which such a process has occurred which beautifully illustrates the pathway of infection from the middle ear to the mastoid antrum by way of nature's channel, the aditus ad antrum. From this central mastoid cell, a further infection takes place through its roof, affecting the dura at this point, and subsequently affecting the cerebral substance adjacent to it, so that suppuration takes place, and we finally have a brain abscess formed which is connected indirectly with the middle ear from which the suppurative process originated.

In this section of the temporal bone which I here show you, the infection has traveled a much shorter route, namely, through the roof of the tympanum, or tegmen typani, as it is called, and the dura lining the inner surface of this bone became involved, and later an extension of the trouble was communicated to the brain substance in this region.

It is in adults that we usually find the infection in this locality, caused, no doubt, by the long-continued suppuration so closely adjacent in the middle ear cavity. The first route of infection described is the one usually occurring in children and young adults, the reason for this being that so many times in children the mastoid becomes involved in a suppurative process complicating either an acute otitis or an acute exacerbation of a chronic purulent condition which is not recognized, or if so, not opened, thereby allowing the poisonous element to remain in the mastoid antrum, where it subsequently creates trouble by a process of extension through the bone and dura to the cerebral substance.

Frequently nature by her most beneficent action prevents an extension of the infection to the brain substance itself by granulations forming on the bone surface of the dura and causing hypertrophic changes in its structure, and walling off for a time at least a further inroad of the infection. Such a condition is called a pachymeningitis, and explains the cause of the persistent localized headaches of which these patients constantly complain.

A collection of pus is very frequently found in contact with the dura in this region, and when present is referred to as an epidural abscess. As an illustration of this attempt of nature to protect the brain substance from injury, I show you a section of a skull with a perforation through the inner table and a markedly thickened dura that protected the cerebral substance which it covers, and the brain within was found upon autopsy to be involved. Several years ago, and in fact until within the last decade, many of the causes of the so-called meningitis owed their origin to just such an infective process as the one described.

Another form of brain disease with which we frequently meet as a complication of either acute or middle ear disease is an inflammation of the cerebral substance itself, and is called encephalitis. It usually occurs following an operation for the removal of an extensive necrosis where a large area of dura has been exposed, as in an obliteration of the sigmoid sinus, and the favorite site is the cerebellar tissue. This condition was formerly said to be caused by an infection at the time of the operation, as the time of its appearance was usually some four or five days following the dural exposure. I do not believe this to be so, but think the cause of infection is carried through the veins from the dura to the cerebellar tissues within, as the poisonous substance is doubtless already in the thickened dural veins and manipulation and irritation of this structure at the time of operation serves only to disseminate it to the brain substance beneath, causing an encephalitis, with usually a fatal result.

Another prolific cause in the past for the development of an intra-cranial infection, or for the permanent loss of audition, or both, was the practice formerly so much in vogue, of doing a so-called Wilde's incision in cases of subperiosteal abscess in children, and expecting that nature would complete the cure. Many of these cases when so treated continued to discharge through the opening made, until a permanent fistula was established, carrying constantly from its source (the infected mastoid process) the products of decay. If later this fistulous tract became obstructed the pus usually found its way through a channel of lesser resistance, namely, the inner plate of the temporal bone, which had become diseased through a long and continuous contact with the suppurative process, thus establishing an intra-cranial infection months, and even years, after such an incision had been made. In the few instances where no permanent fistulous tract was left and the tissue healed, there was still left a discharging ear which later became chronic in character, and in this way jeopardized the future safety of the patient.

When we have a case before us which presents all the physical signs of a subperiosteal accumulation of pus, it should always be evacuated under anaesthesia. But we should not stop with the simple evacuation of the external abscess. We must proceed further and, opening the mastoid process, remove the disease already there, as the external manifestation of pus in the vast majority of cases is secondary to a primary mastoiditis. There are a few cases met with which are an exception to this rule. They are very young children, and in these the pus burrows up from the middle ear, external to the mastoid, and finds its way beneath the periosteum usually at the petro-squamous suture. But even if the latter condition does exist, it is always safer for the future of our patients to explore the mastoid and thus prevent the possibility of any subsequent invasion occurring later.

In a personal experience of 162 cases of subperiosteal abscess operated upon, in children whose ages ran from five weeks to eight years, pus was found in the mastoid process in 158 of the cases. In the four children where the pus was absent, there was a large amount of granulation tissue and softened bone found; so that I believe it is very unwise to merely evacuate the subperiosteal accumulation and hope that nature will come to our aid and complete a cure which should have been accomplished by the surgeon.

Another phase of what may properly be called otitic brain disease is a thrombus, complete or partial, of the whole or any part of the sigmoid or lateral sinus or adjacent blood currents, and occurs as the result of either an acute or chronic suppuration of the middle ear, although it is more frequently associated as a complication of a chronic purulent condition. It does, however, complicate acute cases, and when it does, the infection is usually of a virulent type. The symptoms are recognized to-day as somewhat more complicated than formerly, this complexity being due to the fact that there are classes of cases differing very materially, symptomatically speaking, from the type known as typical, so that at the present time we are enabled to classify the symptoms as belonging to a certain group of cases, which, combined with our clinical experience, places at the disposal of the practical otologist a group of fairly definite symptoms from which to make a positive diagnosis of the disease.

*In reviewing the symptomatology of this disease, I shall follow the lines of my personal experience and do so under three heads. First, the symptomatology in the typical cases; second, in the atypical cases; and, third, in those where the bulb and sinus are primarily involved without macroscopic disease of the mastoid process. As the majority of those cases coming under our observation are those secondary to a mastoid involvement, or developing after the mastoid operation has been done, there are a few definite symptoms present which are fairly constant and which enable us without delay to recognize this condition.

SYMPTOMATOLOGY. *Temperature*: The symptom which I consider by far the most important is that of temperature and depends upon the amount of septic material entering the general circulation which, if it be large in amount, is at once followed by a rise from the normal to 104°, 105°, 106° F, and many times higher, and this is quickly followed by a remission to near the normal point or below. There may be only one rise during a period of twenty-four hours, or several may take place, depending upon the rapidity and the quantity with which the poison is entering the general circulation. If the patient be kept under observation for several days, these exacerbations of temperature become more frequent and the variations greater.

Chills: They are present in only a portion of the cases seen, possibly fifty per cent., and I am inclined to believe that this is high. When present they usually precede the rise in temperature, and in some patients are followed by profuse sweating. Many of the cases coming under our observation exhibit no definite chill, they merely complain of a slight chilly sensation, and frequently this is overlooked unless the nurse in attendance is on her guard and watching for such a manifestation. In a post-operative mastoid case with frequent variations of temperature, these slight chilly sensations are quite as important as though a decided rigor were present. In a communication before the American Otological Society in July, 1899, particular stress was laid upon this point, and during the intervening years at least one-third of all the cases observed has borne out the importance of watching for this but infrequently spoken of symptom.

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*Abstract from a paper read before the Section on Otology of the American Medical Association, at Atlantic City, N. J., June, 1907.

Pulse: In case of phlebitis, when there is a sudden high elevation of temperature, there is a corresponding rapidity of the pulse rate, ranging from 120 to 150 per minute. In cases exhibiting a lower temperature range, the pulse is often between 100 and 130, and when the existing phlebitis is complicated by a collection of pus in the brain, it is much slower.

Respiration: In many of the cases of phlebitis, the respiratory changes are but slight, but increase during the hyperpyrexia, at times becoming as rapid as forty or fifty a minute. This is especially noticeable in the younger patients.

Pain: In many cases of phlebitis coming under our observation, the degree is greater than that present when only an ordinary mastoiditis exists, or than that subsequent to a post-operative case. The pain is usually referred to the side of the head and to the occipital region, and is many times localized in the region of the torcular. In a few cases where the internal jugular vein becomes infected early, there is decided pain in the neck along its course, and occasionally this pain will radiate down over the chest of the affected side. In many of the cases the pain present in the neck is caused, I believe, by an infected chain of lymphatic glands, rather than by any obstruction in the vein.

Nausea and Vomiting: These symptoms are usually present at some stage of the disease in a moderate or pronounced degree. They usually complain of nausea first, particularly on being aroused, or moving the head. This may be followed by slight vomiting, which later becomes more pronounced after the drinking of fluids. It may however, occur at any time independently of the taking of solids or fluids, and the amount is usually small.

Intra-ocular Symptoms: In only about one-third of the cases coming under my observation, have eye symptoms been present. This may be due to the fact that many of the cases were seen and operated upon early. Had they been left until a later period of the disease, intra-ocular changes might have taken place. In a small number of the cases, when the phlebitis has extended to the cavernous sinus, there is pronounced swelling and puffiness of the eye and lid on the affected side.

Vertigo: I have observed its presence only in those cases of long standing purulent middle ear involvment, or where the meninges were affected.

Cerebration: This has invariably been normal except in advanced cases. While some of the patients are drowsy and do not wish to be disturbed, yet they answer questions intelligently when aroused. If, however, the disease be allowed to progress, this drowsiness increases, and is followed by evidences of impaired cerebration.

Physical Signs: We occasionally find the presence of oedema in the mastoid region, and oedema over and around the exit of the emissary and occipital veins. In some of the well-advanced cases, both in adults and children, there is a marked stiffness of the muscles of the neck on the affected side, and the head of the patient is drawn well over toward the shoulder of this side, showing a marked torticollis, as it were. Combined with this, there is a well marked rigidity of the muscles present. A physical sign which the books tell us to look for in phlebitis of the vein, is a hard cord like swelling in the neck. While unquestionably such a physical sign does occur, in the experience of the writer, it is very infrequent, and only present in cases far advanced in the disease. I have never been able to demonstrate such a condition but once, though I have tried to do so repeatedly before operation.

In cases well advanced in the disease, metastatic deposits may occur in any joint of the body, either single or multiple, closely adjacent to or remote from the original focus of infection.

General Symptoms: Among these may be mentionel loss of appetite, a dry and heavily furred tongue, and a foul breath. The face is anxious; there is a pallid look; the skin is dry, and later presents a yellowish tinge indicative of sepsis.

ATYPICAL CASES.

These are cases invariably following a mastoid operation which usually do well for a few days after the mastoid has been opened. Then the patient becomes restless, irritable, and disinclined to take food. The tongue which before was clean and free from any coating, becomes dry around the edges, and presents a whitish glazed appearance in the center. The pulse increases from 100 to 130 or 140 a minute, and there is a slow gradual rise in the temperature to 103°, 104°, 105° F, or higher, remaining so for several days. In some of the cases it will not vary a degree in twenty-four to forty-eight hours, while in others there is a little more variation, but there are no sudden drops, and no sudden rises. The patients complain of headache and occasionally of nausea, but few reach the vomiting stage. They are unable to sleep for any considerable period of time, and if surgical measures are not instituted, they later show all the signs of pyaemia. There is no chill or chilly sensation present, cerebration is clear, the only evidence of any mental disturbance being an occasional irritability of temper, and this is especially noticeable when they are first aroused. Later they become exceedingly drowsy, and the skin begins to take on a yellowish hue, and there is profuse sweating.

Physical Signs: A physical sign which I consider of the utmost importance in this class of cases is that when we inspect the mastoid wound in the early stages of the disease, we find every portion of it apparently doing well and covered with granulations except one point, and this point is the bone forming the sigmoid groove. We will find the bone in this region darker in color than when it was first exposed at the time of the operation, and there will be no granulations found upon any part of it. In other words, we have a mastoid cavity showing all the evidence of healing except the bone over the sigmoid sinus. Should the infection progress farther and be allowed to go unchecked, we will find in three or four days that the mastoid wound would present an altogether different picture. The parts that were formerly covered with healthy firm granulations have now become pale and flabby, with a tendency to soften and break down, while the bone over the sinus still remains dark in color, perfectly dry, and devoid of all reparative process. If during the mastoid operation the sinus was exposed, we find at this stage the dura covering it presents a whitish or gray appearance, devoid of lustre, and at times covered with a plastic exudate. If pressure be brought upon this exposed area of the sinus, it will be found easily compressible.

BULB AND SINUS PRIMARILY INVOLVED.

*In this third class of cases, there is an acute purulent otitis present with the usual symptoms found accompanying this condition in an aggravated form, and the subsequent symptoms detailed are, I believe, the result of a direct infection from the tympanic cavity to the blood current closely adjacent, namely through the floor of the tympanum to the jugular bulb. The explanation of the possibility

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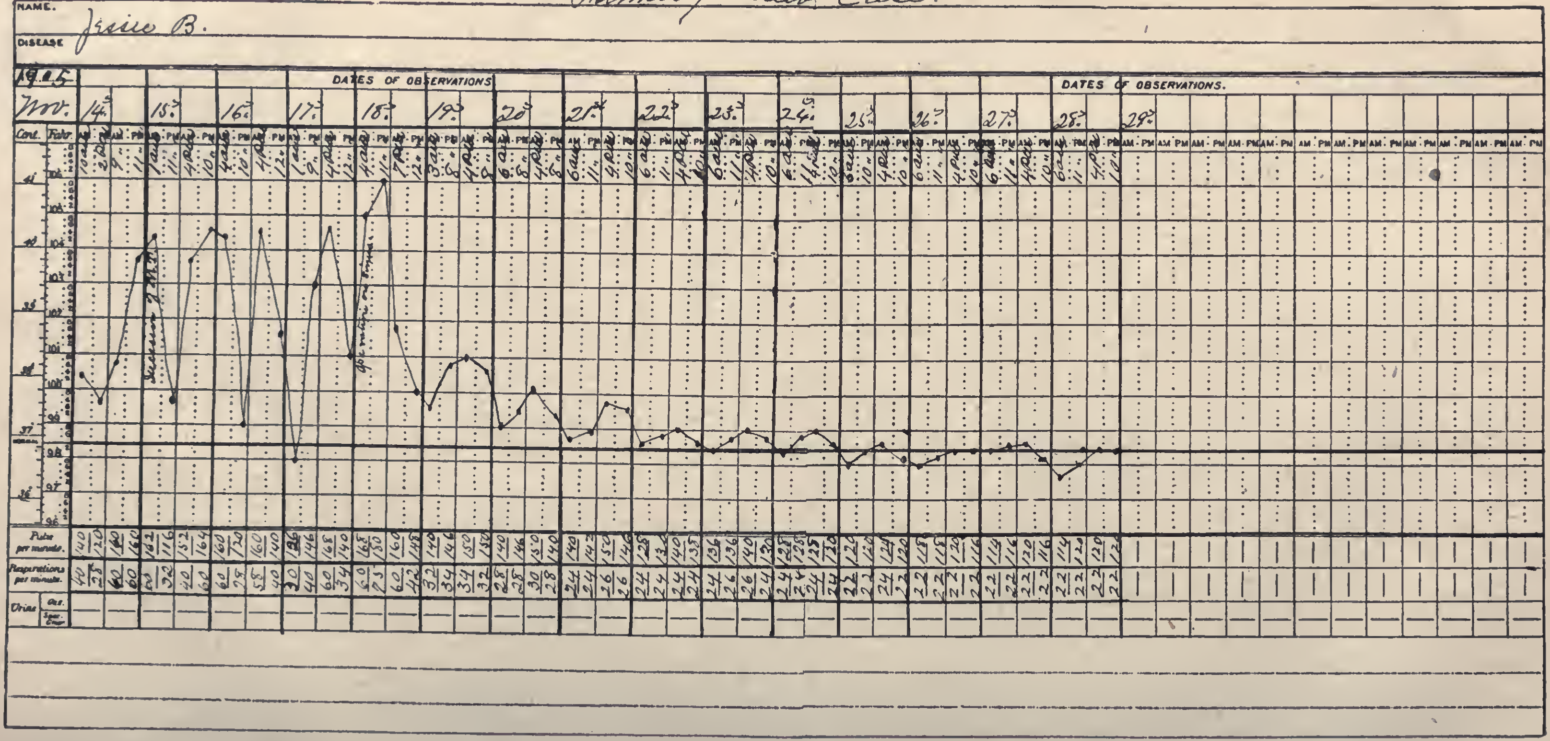
*Abstract from paper read before the American Otological Society at Boston, Mass., May 9th and 10th, 1905.

Primary Bulb Case.



of this is quite clear if we bear in mind the fact that in a certain percentage of the skulls examined we find an unusually high dome encroaching upon the middle ear cavity, or a dehiscence may exist in this region. Under such conditions as these, it can readily be seen how an active purulent infection of the middle ear cavity can affect the blood current without first having to travel its usual course through the venus structure of the mastoid bone, the pathway of infection being through the small communicating veins and lymphatics, or by a process of absorption directly through the thin wall of bone in this region.

The symptom in these cases of greatest importance is an unusually rapid rise in temperature (see chart) from 99° or 100°, to 104°, 105° or 106° F, and quite as sudden as the rise, a fall to 97°, 98° or 99° or possibly 100° F.

The temperature may remain low for several hours, and then quickly rise again to the points first mentioned, to be followed by a remission, and this may go on indefinitely until the end. During the exacerbations of temperature the pulse is rapid, ranging from 120 to 170 per minute. There is no chill present. The only evidence of one found in these patients is, that if seen when the temperature begins to rise, they will be found to have cold hands and feet. They are exceedingly fretful and irritable, and later become drowsy. The eye signs are negative. If the temperature range is allowed to repeat itself for several days, the tongue becomes white and dry. During the temperature remissions these patients—and they are usually young children—feel remarkably well, will ask for food and ask to sit up and play with their toys. This is one of the phases of the disease which the parents and the uninitiated find hard to comprehend. They see such an apparent improvement in the little ones that they are misled as to the dangers existing, and often believe they are well on the road to recovery, until the next rise of temperature occurs.

Take for example the symptoms as recognized to-day in a typical case of this disease. Briefly, they are the presence or the history of a purulent discharge from the middle ear, with a sudden rise of temperature, say from 99° or 100°, to 105° or 106° F, with a rapid remission, and this proceeded by a chill, or a chilly sensation, occasional nausea or vomiting and more or less irritability of temper, with drowsiness. These are quite sufficient to notify the otologist that the patient's condition is not satisfactory. Should these symptoms be repeated in a few hours, there is evidence enough to warrant the exposure and exploration of the various portions of the sinus by the aurist.

In no branch of aural surgery to-day have more brilliant successes been made, than in the early recognition and operative treatment of this disease. Contrast this with the older methods of treatment—I shall not say recognition—for such a condition was not recognized a few years ago, where the cases were treated for almost every disease in the category until the meninges became affected, or died from general sepsis or pyaemia, even though the cause in the majority of cases was not even dreamed of. Even to-day, many of these cases are treated for that much maligned disease, malaria, and later when a general sepsis has occurred, if recognized, it is too late to save the patient's life by any operative procedures.

There is a phase of this disease that I wish to call particular attention to because it is so misleading and unreliable. I refer to that stage of it which is present in the majority of the cases during the temperature remissions, namely: we have often been mislead by the patient's apparent improvement at this stage, and during the earlier years of observation it was a most difficult and sometimes impossible matter to understand why, if the patient had such a serious condition present, he should apparently feel so well between the exacerbations of temperature. A closer study of the cases as presented subsequently, taught us that this could be explained by the fact that the rise in temperature is caused by some of the infective material in the sinus being carried into the internal jugular vein, and disseminated through the body, thus causing a systemic poisoning. When this occurs, we observe the chill, temperature, nausea, vomiting and marked drowsiness, with other symptoms of minor importance. But when the general system has eliminated this poison, or the major portion of it, we find our patients feeling brighter, more cheerful and inclined to be optimistic, as though they were far from any danger, when in reality the danger is just as eminent if not more so than before, for the symptoms enumerated recur again and again if the patient be left without surgical aid until such time that operative procedure, even though it be resorted to, is too late to save life.

Many of us can, I think, indulge in a retrospect, and recall case after case of so-called idiopathic meningitis and general pyaemia that resulted fatally, when had the true cause been known we would have recognized the middle cavity as the starting point of it.

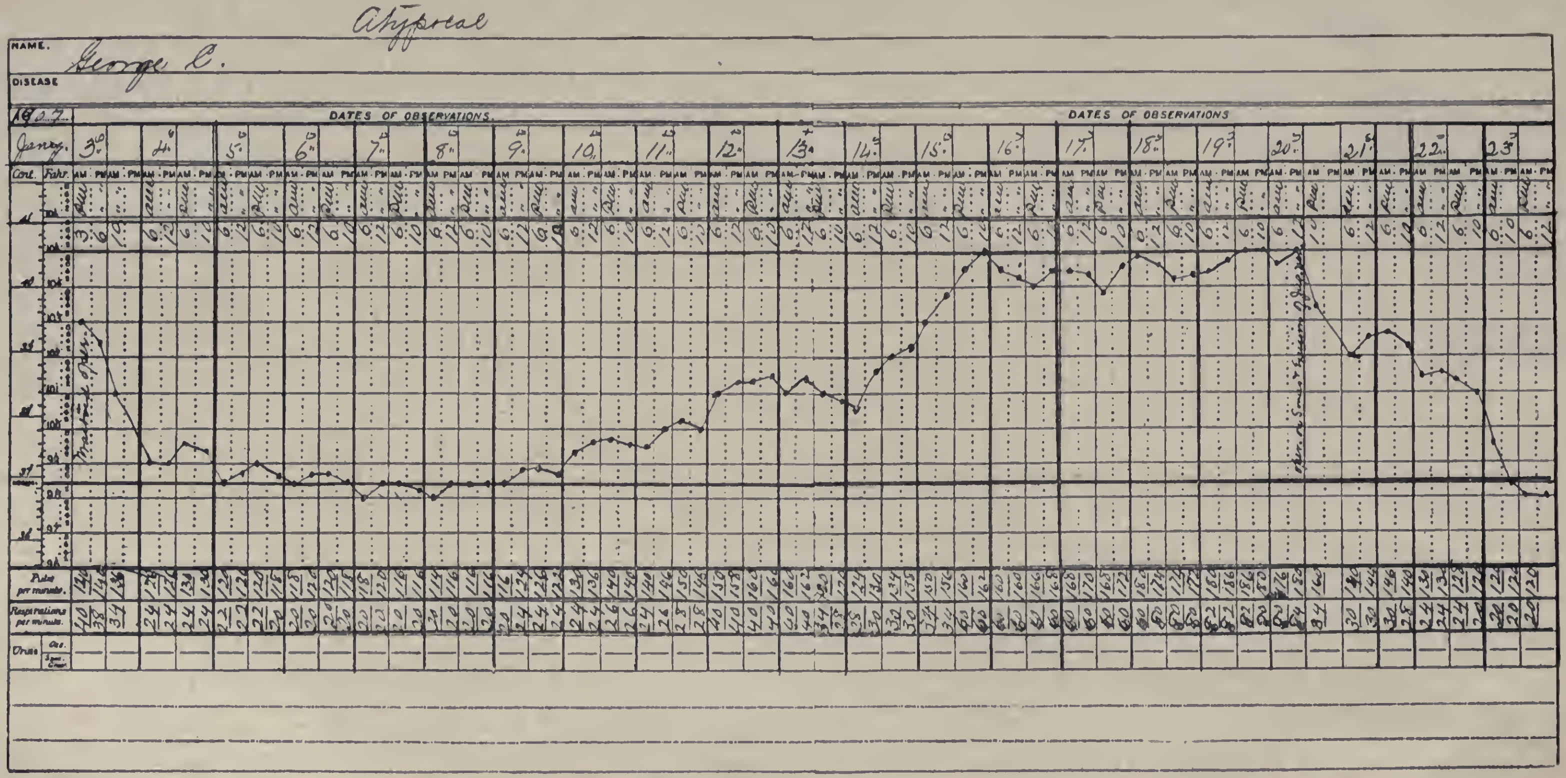
Diagnosis: The first class of cases is easily recognized, our diagnosis being based upon the temperature changes and the presence of a chill or chilly sensation preceding the rise in temperature, and following an operation on the mastoid. If most of the symptoms given in this case be present, it is of course comparatively easy to make a diagnosis, but if several are absent, the diagnosis can be made from the temperature changes with the chill, or chilly sensations that are present. In those cases where the sinus is operated upon at the same time that a mastoid operation is done, and we have no previous symptoms to guide us as to its involvement, we determine whether or not it is necessary to open the sinus at that time by the presence of a necrotic area of bone over and around the sinus, with usually an epidural collection of pus, commonly called a peri-sinus abscess. The dura covering the sinus wall is at times thicker than normal, and darker in color, or it may present a lustreless appearance, darker at one point than another, and usually the lower end toward the bulb is a whitish or gray color. At times there is a grayish plastic exudate adherent to the sinus wall, and the sinus looks flat and does not present a rounded appearance when divested of its bony covering, is easily compressible, and does not fill quickly when pressure is removed.

In the absence of previous symptoms referable to sinus involvement, the presence of an epidural or a peri-sinus abscess is not a positive indication for opening the sinus. It is only when the physical signs described above are present with or without the epidural collection of pus. Nor should the sinus be molested if the dura covering it be protected by granulation tissue, for this is an effort of nature to combat the progress of the disease.

Bacteriological examination of the discharge from the ear is of value in certain cases, as when the bacillus of Friedlander is found, the infection is prone to greater activity, travels more rapidly, and the sinus and veins are involved earlier than in many of the other forms of infection. Another valuable aid in diagnosis is the differential blood count,—not so much for determining if a leucocytosis is present, as to determine the polynuclear percentage. With a percentage of over 75, no matter what the leucocyte count be, whether great or small, we are almost certain to find an infective process which calls for surgical intervention. The leucocyte count is of value only in giving us information as to the patient's resistance to the disease.

An important point to be borne in mind in connection with the differential blood count is, that the polynuclear percentage is not as high when pus is present in bone cavities, as when it is in the soft tissues of the body. Take for example an ordinary pus infection of the mastoid bone free of complications. Here the differential count will show say from 70 to 80 per cent of polynuclear cells, and many will tell us that such a low percentage precludes the possibility of pus being present, which is not so. The explanation being that we have a bony cavity to deal with, containing pus that is undergoing little systemic absorption. But, complicate such a bony cavity by an involvement of an adjacent blood current, and there will be a rapid increase in the polynuclear cells from 85 to 95 per cent and even higher.

In the second, or atypical class, occurring as they do some days after a primary operation on the mastoid, the diagnosis is made on the temperature changes, and the patient's general condition. Take, for example, a case of mastoiditis that has been operated upon say four to twelve days previously, the temperature during this interval following the usual course of a typical post-operative mastoid case. On the next day when we see the patient we find him a little restless, appetite which before was good, variable, the tongue beginning to become coated, the pulse, which the day before ranged between 70 and 80 is now between 90 and 100, and the temperature that was normal has risen to 99.6° or 100.6° F or thereabouts. The next day the temperature will be from one to two degrees higher, with no marked remissions; the patient's general condition has changed somewhat, the restlessness is more pronounced, there is a distinct irritability, and he is disinclined to take food. The tongue has become dry around the edge, with a thicker coating than the previous day, the pulse has increased in rapidity from 110 to 120 per minute. He complains of headache, not localized, but general, and an occasional feeling of nausea, and is unable to sleep for any considerable period of time. When seen the following day the temperature has gradually risen to 104° F or higher, the pulse is now running from 120 to 140 per minute, and shows a diminution in tension. The headache is more pronounced, and the restlessness, sleeplessness and irritability are prominent features which cannot fail of recognition. The white or grayish coating on the tongue has now changed, and is brown and dry like leather, and has a glazed center. If the disease is allowed to progress without efforts to combat it, we find within the next twenty-four hours that the temperature has risen to 105° F or even higher. The pulse has become more rapid, 140 to 150 per minute, showing less volume and becoming weaker, and


Atypical
NAME. George C.
DISEASE
1907.
DATES OF OBSERVATIONS.
DATES OF OBSERVATIONS
Jany. 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Cent. Fahr.
AM PM
105 104 103 102 101 100 99 98 97 96
Mastoid Oper.
Pulse per minute.
Respirations per minute.
Urine Ozs. Spec. Grav.

coincident with this is a refusal to partake of food. At this stage they become drowsy and exceedingly irritable when aroused, and wish to be let alone. As the disease progresses the temperature will practically remain stationary, with no marked remissions. (See chart.) The pulse gradually becomes weaker, and we have all the evidence of a general pyaemia present.

A very valuable aid in diagnosis to us in this class of sinus disease is the physical sign spoken of earlier in this paper, namely the absence of granulations over the inner table covering the thrombosed area, and its change in color from normal to dark. Another physical sign which aids us is this: if the sinus was exposed at the time of the mastoid operation, we will find that the dura covering it has undergone a marked pathological change, as it presents a grayish appearance, is lustreless and covered with a plastic exudate, and the vessel itself looks flat.

In the third class of cases, namely, when the bulb and sinus are primarily involved, the diagnosis is made almost entirely from the rapid excursions of temperature, closely following an acute purulent otitis. Bacteriological examination of the discharge from the ear is of value here as in other cases. The same is true of the different blood count, and the utmost importance should be attached to it when the polynuclear proportion is found to be between 85 and 95 per cent, as I believe this is a positive evidence that the patient is suffering from an acute septic process. As a still further aid in diagnosis, all other diseases should be ruled out by a process of elimination before operation is decided upon.

Treatment: While it is beyond the scope of such a paper as this to go into the details of treatment for such a condition, it may not be amiss to mention a few points in the technique. In dealing with this complication the treatment of the sinus will be spoken of first, and secondly, that of the vein when involved.

In this disease, as in many other surgical cases, each individual case is a law unto itself, and proceedings should be instituted as seem best to us at the time we are dealing with it. The first step is a complete and thorough exposure of the sinus from a point above the bend or knee down to the region of the bulb, followed by a flushing of the operative field with a hot saline solution, and then by absolute alcohol to insure sterilization before opening the vessel.

The treatment in the first and second classes of cases does not materially differ. Too much bone should not be removed posteriorly, so as to uncover a large dural area over the cerebellum, as it is in that region that a hernia is liable to occur rather than at other points, and its occurrence is usually invited when considerable of the bony covering posterior to the sinus has been removed. After the sinus has been exposed, a small piece of iodoform gauze should be rolled up and placed over the upper end of the exposed sinus, and pressed firmly under the edge of the bony groove, so as to cut off the circulation in the vessel, should it be present. A similar piece of gauze should now be placed over the sinus in the region of the bulb and pressure exerted here, after which the dura forming the anterior sinus wall should be incised freely with a scapel or scissors between these points, and the contents of the sinus evacuated. The reason for abandoning the use of the aspirating needle as a diagnostic aid in these cases is because many times a thrombosed sinus might contain a small clot, while the remainder of the vessel would be filled with fluid blood, and unless the point of the needle engaged the clot, fluid blood would be drawn into the syringe, thus giving a wrong impression of the condition existing within. Or a small parietal clot might be present and the needle would pierce this clot and then be passed further into the lumen of the vessel, and draw blood into the barrel of the syringe. Whereas, if we use a scalpel or scissors to open the sinus, and a free incision is made, if the clot is a small one it is washed out through the opening by the blood pressure from within. Should we be unable to obtain a flow of blood from the distal end of the sinus after the pressure has been removed in this region by taking the roll of gauze away, then we should make a further exposure in this region, and proceed backward as far as the torcular if necessary, provided we do not secure a free return flow of blood before reaching it, for if we do not obtain a blood current in this region sufficiently free to show that all obstruction has been removed, our patients do badly subsequently, either from an extension of the infective process to the blood channels, or the development of an encephalitis one or two weeks later, caused by an extension of the infection we have overlooked in this region.

When a thrombus is removed and the blood flow established from the proximal end, hemorrhage should be allowed to continue for a few seconds so as to remove any small clot or septic material that may be present further back in the vessel. This hemorrhage is then easily controlled by packing a small piece of folded gauze directly against the opening of the vessel.

The lower portion of the sinus is proceeded with in the same manner. After the removal of the clot, and whenever pus and broken down material may be present, an attempt should be made to restore the circulation at the bulb. In about half the number of uncomplicated cases coming under our observation, this can be done quite easily, but in others it becomes impossible without dangerous manipulation. By this I mean if very much time or effort be consumed by our attempt to restore the return circulation at the bulb, we run the chance of dislodging some foci of septic material from the bulb and having it thrown at once into the general circulation, thus increasing our systemic poisoning. In cases where the sinus does not contain pus, and the symptoms presenting do not show the evidence of a jugular involvement, it is better to cease our manipulations, even though a return current of blood be not established. Cleanse the operative field, and pack the sinus firmly at the bulb with gauze rather than proceed any further, as experience teaches us that a large number of these cases recover without resort to further surgical procedure. This is especially true of the cases that are operated on early, before marked systemic symptoms have developed, and before the coats of the vein below have become infected with the micro-organisms of the disease. In all of these cases encountered, whether of the septic or non-septic variety, we should thoroughly expose the lower end of the sinus at the bulb, as here quite frequently is found the clot, and not above, owing to its close proximity to the floor of the tympanic cavity, and this is especially true when we have a large jugular bulb to deal with.

Care should be taken to excise all sloughing edges of dura, for if left untouched after the sinus has been incised they will retard the healing process. When pressure has been removed from the bulbous portion of the sinus, we at times encounter a free return flow of blood, but whether the source of such a hemorrhage be from the internal jugular vein, or from the inferior petrosal sinus, we are unable to say, for it is as likely to come from the sinus as from the vein. But when such a free return flow is present, and the sinus above contained upon opening it, a parietal or firm and non-disintegrated clot, we usually end the operation here and await further developments. If, upon the other hand, we find upon exploring the sinus, pus or a disintegrated clot present, or both, we should desist from any further manipulation above, protect our already exposed field of operation, and proceed at once to expose, ligate and resect the internal jugular vein from a point below at the clavicle, to its exit from the skull. Should any of its tributaries be found involved, they should also be ligated and resected well beyond any point of macroscopic involvement. All diseased glands exposed during the resection of the vein should be removed. After this has been accomplished, the contents of the sinus should be evacuated in the manner spoken of earlier in this paper. When such a procedure as this is carried out, it usually prevents the possibility of any further infection being thrown into the general circulation through the medium of this vessel. To be sure, a still further infection may take place after the vein has been resected, through the medium of the anterior and posterior condyloid veins, or the occipital and petrosal sinuses.

In many of the cases where the vein has been removed primarily, before the evacuation of the sinus contents from above, we find that the return of blood from the region of the bulb is quite free, as we would expect to find it if we had the internal jugular vein carrying on its usual function, the blood coming, no doubt, from the inferior petrosal sinus. This is a valuable point to be remembered, for many operators will tell us, that when we succeed in obtaining free hemorrhage from this end of the sinus, it shows that the vein below is uncomplicated and is performing the function for which it is created, that of transmitting an obstructed current of blood back to the heart, when, in reality, there is not a drop of blood present which has its source from the vein below. I have seen this demonstrated several times when the internal jugular vein was ligated and resected as a preliminary to exploring the sinus above. Occasionally, after the vein has been removed, we are unable to obtain a return flow from the bulb, which means that the inferior petrosal sinus is involved, and when such a condition confronts us (which fortunately is not frequent) we should, provided the patient's general condition will allow it, expose this sinus and remove the obstruction, as otherwise we are unmindful of the best interests of our patient by allowing an infective process to remain, which may at any time cause trouble. Should the superior petrosal sinus be involved, it should be exposed and treated in a like manner.

When the internal jugular vein is removed, the treatment of the neck wound is optional, either by the open method with packing and later drawing together by straps, or suturing at the time of operation, and inserting a large cigarette drain. I prefer this latter method with wet saline dressings changed every twenty-four hours, and each time the dressing is reapplied, a small portion of the drain removed, so that at the end of the fourth or fifth dressing the drain has been entirely removed, and primary union accomplished in the majority of cases.

In the primary bulb and sinus cases—the patients being nearly all young children—it would seem that the treatment should be the same as in the other cases, but here we must remember that when these cases are caused by a primary infection of the blood current, and when operated upon early, the percentage of recoveries is in favor of removing the clot without ligating the vein, for the young patients do not bear prolonged operations well, and it is a matter of greater difficulty to ligate and resect the internal jugular vein in a young child than it is in an adult, for we have to deal with a neck that is short and chubby, encountering usually a number of enlarged glands, which prolong the operation many times beyond the safety point. If subsequent ligation becomes necessary, it can be done rapidly, and the young children need not be subjected to the added risk of a prolonged operation.

It must be borne in mind, that in this class of cases, when a free hemorrhage is obtained from below, we can never be sure that all of the infective material has been removed, for it is impossible to pass a curette from above into the bulb, and in all probability a larger number of our cases operated upon without ligation of the vein, have some infective material left in the region, but not in such quantity that the system cannot care for it by a process of elimination. There is a type of cases in young children to which strong exception must be taken to the conservative method of treatment. I refer to those cases, when, upon opening the sinus, pus, or a broken down clot be found. When such a condition as this confronts us, whether there be a free hemorrhage at the bulb or not, I believe it is imperative for the safety of our patient, that the vein be removed at once, and not wait for a train of symptoms that are too well known, and unfortunately, usually fatal to the patient.

There are many post-operative mastoid cases that fail to progress favorably, showing many or all of the so-called positive signs of sinus infection. And yet, when these cases are operated upon subsequently, and the sinus explored, no clot can be demonstrated, although from the moment the sinus is opened and a free hemorrhage takes place, the patient begins to improve, and an ultimate recovery follows.

What is the explanation of this? Simply that we have a small parietal or central thrombus to deal with, and when the sinus wall was freely incised there was a sudden gush of blood outward, which carried the clot with it. Many times careful search will reveal such a thrombus adherent to the towels surrounding the operative field, or to the gauze that has been used in sponging.

In our septic cases when after operation the patient does not progress as favorably as we think he should—the temperature remaining high, with only a partial subsidence of the general symptoms, and where we are doubtful whether any further operative procedure is demanded, it is wise to wait for a time before any other radical measures are taken. For we must remember the fact that we are dealing with a septic case which took several days to develop, and that there was a gradual absorption into the system of a virulent poison, and that the post-operative history of such a case would show the slow elimination of the poisonous element absorbed, even though the source from which the infection emanated had been removed.

Before leaving this important subject, I cannot too strongly urge the necessity for an early operative procedure. We should not procrastinate until the infective material so thoroughly permeates the system that all possible chance to save the patient's life is gone. The most favorable time for these patients to be operated upon is during the temperature remissions, for, if done then, they bear the shock of operation much better, and react more favorably than if operated upon during an exacerbation of the temperature. This point has been well demonstrated in prolonged operation, as in the resection of the vein, and the removal of the infected glands following the mastoid operation.

Pachy-Meningitis. One of the most frequent of the pyogenic infections arising from middle ear suppuration is pachy-meningitis, a condition very frequently found complicating mastoiditis. When present, the one prominent symptom always complained of by the patients is persistent and localized pain over the site of the pus accumulation. This with marked tenderness upon pressure over the bone may constitute the only prominent sign that is present.

The treatment of this condition is a free exposure of the dura and the removal of all necrotic bone adjacent to it, but care should be taken not to separate the adhesions between the skull and dura, which demonstrates nature's effort to localize the process.

Lepto-Meningitis. In former years when a lepto-meningitis followed a middle ear suppuration, it was invariably fatal, because the infected area was seldom, if ever, exposed, cleansed and drained.

Or, if such a procedure was carried out, it was only after the patient's condition had become so serious that it would have been wiser not to have operated, the vitality being at such a low ebb that death followed quickly. It was left to the brilliant surgery of Macuen to early recognize and expose these infected areas, and institute proper surgical methods for their relief and cure, and to-day a goodly number of these cases are saved by the treatment advised, and first practised by this eminent surgeon.

Time does not permit of even a brief abstract of the symptomatology and diagnosis of this most important intra-cranial lesion. One point, however, may be mentioned that is an aid to us now in the diagnosis, as well as the treatment. I refer to lumbar puncture, for by the examination of the spinal fluid we are now able to make an earlier diagnosis, as well as relieve some of the most distressing symptoms by drawing off a considerable quantity of cerebro-spinal fluid, thus relieving pressure, and in some instances in severe cases, prolonging life.

Brain Abscess. This complication of purulent otitis is often very difficult of recognition because of the complexity of symptoms that may be present, a part of which may be due to other intra-cranial conditions than that of the abscess, and for this reason a positive diagnosis is impossible in many of the cases. In cerebral abscess, the symptoms presented in those cases observed by the writer are briefly as follows:

Symptoms. The presence or history of a purulent discharge from the ear of the affected side, persistent and localized head pain, tenderness on percussion, fretfulness, followed later by irritability, moaning, crying out in sleep, and in many, gritting of teeth, insomnia, nausea with vomiting, drowsiness with intolerance of light, aphasia, depending on location of the pus collection, and vertigo well marked in some cases. The nerve manifestations in the majority of cases have been of but little help in arriving at a diagnosis. Intra-ocular changes when present are valuable aids, but by no means positive. The pulse is slow, from 48 to 65, in cases uncomplicated by other intra-cranial affections, and when complicated it is much higher and very misleading. The temperature in an uncomplicated case is low, ranging from subnormal to a little over a hundred. But in many cases of the acute type the lesion is coincident with one or more complications, and here the temperature is much higher, and again misleading.

Diagnosis. The diagnosis is usually made on a majority of the symptoms enumerated, the differential blood count aiding us very materially. In the abscess of acute origin, before a limiting membrane has had sufficient time to become organized, there will be a greater amount of absorption, and with this a correspondingly higher polynuclear percentage ranging from 85 to 96 per cent. If the abscess is of the chronic variety from an old purulent condition of the middle ear, and of itself of long standing, the polynuclear percentage will be considerably lower, owing to the fact that there is but little systemic absorption occurring, because the surrounding brain tissue is protected by a more or less dense limiting membrane.

Another aid which may be of more value to us in the future than now is a radiograph of the cranial contents. In one case it has been of help to the writer. It has, however, been used so seldom that as yet no definite value can be attributed to it. It is to be hoped, however, that in the near future an improved technique may increase its value to us in this line of investigation.

Cerebellar Abscess. A collection of pus in this region may remain unrecognized and give but little trouble for years, this being especially true if the accumulation be small, with well formed walls. But if situated deeply the lack of co-ordination on the part of the patient makes us suspect at once that we have a lesion of the posterior fossa with which to deal. An abscess in this region of recent origin may present many of the same symptoms as when located in other regions of the brain.

Treatment. In searching for a collection of pus in the brain, irrespective of its location, a few points in the technique may be mentioned. It is well to bear in mind when we are searching the various regions of the brain for pus, that the skull should be entered at a point corresponding as nearly as possible to the floor of the lobe we are about to explore, in order that free drainage may be secured. There should be sufficient exposure of the dura to enable the operator to thoroughly explore the region in all directions, for many times the otologist is at fault here because he makes too small an opening in the skull, and produces more injury to the dura and cerebral substance by so doing than if the field of exposure were larger. When the dura has been explored, it is usually incised in its horizontal plane, care being taken to avoid severing any large blood vessels which supply it. After it has been incised, silk sutures should be passed through the flaps, as in this way they can act as retractors drawing the edges apart, and do not injure the dura. Should the brain exploration prove negative, they can then be used to close the opening that has been made, before proceeding to expose other portions of the dura. There are several methods of exploring the brain, and all have their advocates. My own experience has led me to rely upon the use of a long narrow-bladed scalpel, and if pus be encountered, to withdraw the knife and introduce into the opening made by it, a pair of forceps with the blades closed, and then enlarge the opening already made by separating the handles. This will make an opening sufficiently large to admit of the drainage of any cavity that may be found. The use of the finger to enlarge the opening made by the knife in the cerebral tissue is, I believe, fraught with danger to the surrounding tissues on account of the pressure it exerts. The cavity may be cleaned by one of two methods, depending on whether we are dealing with a pus accumulation of a recent or remote origin. If of recent origin, and without the presence of organized tissue to wall it off, the least amount of manipulation is the better, it being cleansed by a very gentle mopping with narrow strips of sterile gauze, and drained by inserting a small wick of gauze down to the bottom of the cavity, allowing the brain substance to collapse around it, for it is a well demonstrated clinical fact that brain abscesses of the acute type discharge but little after evacuation, and consequently do not need to be packed. If, however, we are dealing with an abscess of long standing, there will be, aside from the pus, considerable broken down and disintegrated brain tissue which can best be removed by gentle irrigation with a warm saline solution, after which the cavity can be mopped out as above with sterile gauze, and drainage can be accomplished by passing a large wick down to the bottom of the cavity. This wick can be moistened and rolled in powder composed of equal parts of iodoform and boric acid, after the manner formerly advised by Macuen. But in addition to placing a wick in such an abscess cavity, the whole interior of it should be packed quite firmly with gauze to promote repair, for with its limiting membranous or connective tissue wall it does not collapse around the wick as does the acute type of abscess. A very serviceable drain in use is also that of a decalcified turkey bone.

Before draining the abscess cavities, the utmost diligence should be exercised in searching for multiple abscesses which occur frequently, and are many times overlooked and found only at subsequent operations or upon autopsy.

There are a few intra-cranial lesions of the pyaemic type, otitic in origin, that I have not mentioned, such as a thrombus of the cavernous sinus, etc., but I have omitted them purposely as they occur very infrequently.

In order that fewer of the pyogenic diseases that have been considered may occur in the future, it is our duty as otologists to impart to the undergraduate of medicine in our colleges, the gravity of a running ear, so that when they are later confronted with this condition, appropriate means for its relief can be at once instituted.

There is a subject of the utmost importance that deeply interests us as otologists to-day, and though it is one that by no means can properly be classified under the heading of this paper, yet it is of such vital importance to both the aurist and the patient, that I am going to crave your indulgence for a few moments longer to consider it. I refer to the indications for the performance of the so-called radical, or Stacke operation.

*During the past five years there have been so many radical or Stacke operations reported done for the cure of chronic otorrhea, that one is led to pause a moment and ask himself whether all were necessary, or if some of the many cases reported could not have been cured by other and simpler means. I would in no sense be understood as belittling this operation, for I know of no other that offers such safety to the patient as this does, when the indications are distinct for its performance. But from observations and reports, I am inclined to believe that it is frequently done when little or no necrosis exists, and before other means of a simpler and more conservative nature have been tried to cure the discharge.

What then, are the indications for doing this operation, First, the presence of dead bone in the tympanic cavity with or without the presence of cholesteatomatous masses. Second, a train of systems occurring as a result of this necrotic area, which are briefly, headache, localized or general on the affected side; vertigo of the intermittent type; nausea and vomiting at times, and intermittent pain, to be replaced by a dull throbbing pain when drainage is obstructed; unsteadiness of gait in advanced cases, and an intermittent or constant purulent discharge from the middle ear, the odor of which is foul and an indication of necrotic bone.

Combined with these, in a certain number of cases—particularly when the process is of long standing—is a train of mental symp-

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*Abstract from a paper read before the American Otological Society, at its fortieth annual meeting at Washington, D. C., May 7th, 1907.

toms, which in many of the cases produce a mild form of melancholia, caused by the patient's dwelling continually upon the local process. Then again, in a number of cases, there is a persistent and most distressing tinnitus, and frequently this has so upset the patient's mental equilibrium that all other symptoms are of minor importance compared to this most distressing one.

When we have the history of a long-standing discharge from the middle ear, and upon examination we find dead bone present, with several of the above symptoms prominent, then I believe we have distinct and positive reasons for advising the performance of this operation. On the other hand there are many cases in which the patient is advised to have this operation done simply because for a few weeks or months there has been a discharge from the middle ear, scanty in character, where upon physical examination no dead bone can be demonstrated by the probe, or other means brought to aid the examiner. In some of these cases the probe does encounter exposed bone where the mucous membrane covering it has been destroyed in the suppurative process, but an area of exposed bone should not be mistaken for dead bone. Again, take a case giving the history of an intermittent discharge from the ear for several months, with occasional attacks of pain and the audition but slightly impaired. When upon examination we find a drum membrane markedly thickened and swollen, with a small perforation situated some distance higher than the level of the tympanic floor, and the canal containing more or less foul smelling secretion because it has been allowed to accumulate there and decompose, a diagnosis of intra-tympanic caries is immediately made, or jumped at, from the character of the discharge, and an operation advised as the only means of a cure.

In cases like this I believe it is extremely unwise to do a radical operation on the middle ear cavity until all persistent and conservative treatment has failed to bring about resolution in these structures. In many cases of a type similar to that described, cleansing and a free incision in the thickened and swollen drum membrane, so as to freely drain the cavity behind it—this followed by the simplest measures, that of keeping the canal sterile and stimulating the part as needed, will cure a large percentage of these cases, and at the same time preserve for the patient an audition that will be serviceable for the remainder of his life; and this, too, without inconvenience or loss of time. Whereas, if a Stacke operation were done on such a case, the hearing for all practical purposes, namely conversation, would be a thing of the past—to say nothing of the inconvenience, suffering and loss of time to the patient.

Another class of cases frequently coming to the operating table for the Stacke operation is that of children giving the history of a discharge from the middle ear for several months, as a sequel of grippe, measles, scarlet fever and other inter-current diseases. In some of these cases persistent conservative treatment has failed to bring about a cure. The adenoids and enlarged tonsils have been removed, hoping thereby to lessen the mechanical irritation in the naso-pharynx so that resolution will be established, but without avail. If, instead of the Stacke operation being done on these children, the mastoid were opened and the middle ear drained posteriorly, and at the same time a free incision were made in the drum membrane, the suppurative process would speedily cease, and what is of the utmost importance for the future of these young patients, their hearing would be preserved—if not in its entirety, nearly so in the majority of cases. If the so-called radical operation had been performed on these patients, the hearing for all time would be very much diminished, if not entirely lost at the end of a year or two after such an operation.

During the last two years the writer has seen forty-four cases of the above-described type in children, operated upon by the posterior method, and all discharge cured except in two cases. The audition in thirty-eight of these cases was as perfect as the opposite side. Of the remaining six cases, the audition was improved in four, and two had to be operated upon again. the Stacke operation being done at the second sitting.

In a certain number of cases of the adult type, where the only prominent symptom is that of otorrhea, scanty or intermittent, the duration of which is a few months or a year, and a section of the drum membrane is found wanting, it would seem wiser to first perform ossiculectomy and curettage of the middle ear, hoping thereby to cure the condition by promoting drainage, rather than to at first do the radical operation, which however should be done later provided the simpler measures instituted be not successful. The question naturally arises here, "how long should one be content with conservative treatment of a running ear before abandoning it and advising the patient to submit to the radical operation?" I believe it is impossible to lay down hard and fast rules as to the length of time an aural discharge may be allowed to continue without resort to surgical procedure, as many things have to be taken into consideration. The duration of the discharge, its character, the previous treatment the patient has been subjected to, and, above all, his general physical condition—for this may be so depleted and below par, that it is well nigh impossible for a local condition to resolve while the patient's general system is so far below the normal health standard. Generally speaking, however, if from two to four months' conservative treatment does not bring about a favorable result, then operative measures should be advised. This is, of course, if no evidence of a serious extension presents itself during this period. Should it do so, then a prompt operative interference is at once demanded.

When talking to patients about the advisability of having such an operation performed, the question arises as to how much or what should be said relative to audition, whether it will be as good or better than before operation, or if it should be diminished, to what extent. The writer has seen a number of cases in both hospital and private practice where after operation the patient had volunteered the statement, that had he known his hearing would be so poor as it was then he would never have had the operation done. Such a statement as this should have but little weight when we compare the diminished audition with the possibility or probability of an intra-cranial condition occurring in cases where advanced necrosis was present. It should, however, be judiciously weighed in cases where the discharge has been of short duration, as many times these patients are prevented from earning their living at what was their former vocation, after having submitted to the operation. I therefore believe it to be our duty not to omit telling these patients when they come to us for advice that their audition may be permanently impaired by the operation. That there are a number of cases of this type operated upon, where brilliant results are reported from the standpoint of improved hearing immediately following the operation, we all know. But how about the hearing one or two years later, after a substantial mass of scar tissue has formed in the tympanic cavity? It should not be so much the immediate as the future result that we should endeavor to obtain for these patients.

Another point that these patients who submit to a radical operation should be enlightened upon is the possibility of an injury to the facial nerve. While none of us who do this operation expect such an accident to take place, still there is always a possibility of its occurring, no matter how skilful or experienced the operator. Should such an accident occur without our patient having previously been told of its possibility, it places the surgeon in a very unpleasant position, and for this reason, if for no other, it would seem wise to acquaint a patient who contemplates having this operation done of the possibility of such an accident occurring.

After the Stacke operation has been done, the question in the mind of the operator is what to do to bring about a speedy dermatization of the tympanic cavity, and it is the belief of the writer that the primary skin graft seldom if ever hastens the duration of this process. Used secondarily, or several days after the operation has been done, it is, I believe, a distinct aid in the hastening of the healing process in a few selected cases. In the majority of cases where it is used either primarily or secondarily, I believe it does but little good, as it sloughs from the surface on which it has been placed, or is torn away or displaced during the earlier dressings of the case.

This conclusion is based upon a faithful and conscientious trial of it, both as a primary and secondary graft. Without its use, I believe the majority of cases operated upon dermatize quite as rapidly, if not more so, than where it has been used. In the experience of the writer the best means of effecting a rapid cure of the condition operated upon is not the placing of a graft in the tympanic cavity and adjacent to it, but the complete removal of every vestige of the disease, and if this be done a cure will follow in nearly every case, independent of all other aid.

62 West Fifty-second Streett.

Injection of Solid Paraffine in Ozena. DR. RICARDO BOTEY. *Archiv. de rinol., laryngol., otol.*, May-June, 1906.

The author extols the superiority of solid paraffine over liquid paraffine in the treatment of ozena. He describes a syringe of his own design, by means of which injections of either solid or liquid paraffine may be made.

In 360 patients treated by this method, Botey draws the following conclusions: 10 per cent. of cases of ozena are incurable or but slightly benefited; 25 per cent. may be much improved; 45 per cent. are curable, but incompletely, and 20 per cent. of the cases may be entirely cured. SCHEPPEGRELL.

AN ORIGINAL METHOD OF OPENING THE ANTRUM OF HIGHMORE INTRA-NASALLY WITH EXHIBITION OF NEW INSTRUMENTS.

DERRICK T. VAIL, M. D., CINCINNATI, OHIO.

Having faithfully employed in many cases the various operations and therapeutical measures for the relief of chronic empyema of the maxillary antrum, the writer formed the following opinion nearly two years ago:

1st. That *chronic* antrum empyema is incurable by any and all medicinal agents employed locally in the nature of douches, either through the natural opening or through cannulae thrust through any of its walls.

2nd. That any attempt to cure by establishing drainage (?) through gold, rubber or silver tubes, whether inserted through the nasal wall, canine fossa or alveolus of a tooth, is unsurgical and only prolongs the trouble.

3rd. That the drainage and curettement of the cavity through the canine fossa with the establishment of a permanent fistula, in which a rubber plug is inserted for handy removal by the patient, who is taught to wash out his own antrum, only establishes a chronic stream of foul pus in the patient's oral cavity; is disgusting, disappointing and a failure as regards a cure.

4th. That the removal of a considerable part of the turbinal wall, whether done according to the Caldwell-Luc method or any other, provided the opening is large enough, is usually successful in bringing about a cure with little or no after treatment. But the usual method entails a preliminary operation (turbinectomy) and a period of wait, during which time the patient is tortured with fears of the heroic operation yet to come. This feature, together with the nipping, tearing, crushing, boring procedures which are necessary with Gruenwald's and other bone forceps, in order to effect a large enough opening in the antro-meatal wall, was father to the desire to devise a simpler plan which would bring about the desired end without these objectionable features.

The grooved saw solved the problem for me. The first case had had the trocar of Krause thrust through the inferior meatus into the antrum cavity repeatedly and the cavity washed out, with no evidence that it would ever dry up. The end of the grooved saw was inserted through the opening made by the trocar and an oval window sawed out. After that there was, inside of a month, a cure which has remained permanent thus far (nearly two years).

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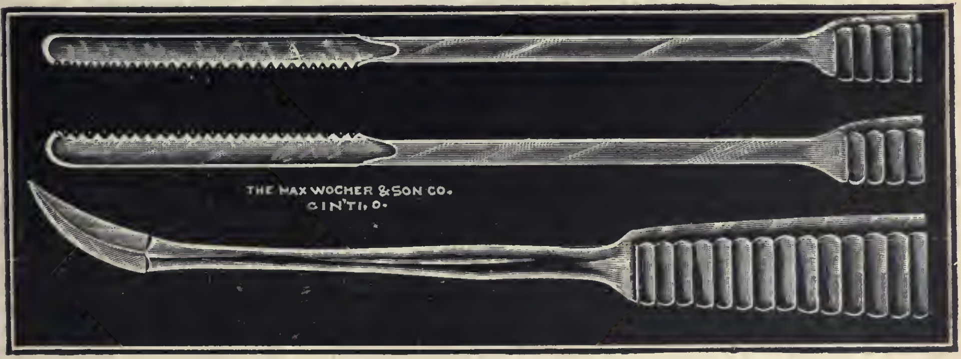
* Read before the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., September 26, 27 and 28, 1907.

I also learned to regard the heroic operation of Caldwell-Luc unnecessary in the cases I have managed by my method, although I do not wish to contend that the former is never indicated. The Caldwell-Luc operation has its place in surgery.

I have operated on seven successive cases of *chronic* maxillary empyema with the grooved saw with such satisfactory results that I would not subject a case to any more severe operation, at least until this method which I am about to describe had been used and proven inadequate.



(Fig. 1.)

The grooved saw, (Fig. 1) made for me by Max Wocher & Son, Cincinnati, can saw in only one direction, and that is circular or oval. The groove is carefully constructed of shallow depth, which will not permit a small opening to be made, for it is necessary to remove a large button of bone if the end of the operation is not to be frustrated.

The principles involved are the following: (*a*) free drainage of a foul cavity; (*b*) ready accessibility to a naturally inaccessible bone cavity; (*c*) establishing a permanent opening in a reservoir of pus to which there is but one natural opening, thereby making another large opening near the floor of the cavity, as it is well known that a reservoir or receptacle having only one opening cannot readily empty itself. This principle is easily proven by drawing off a fluid, say vinegar, from a barrel where there is always a large opening, the faucet, for draining off the fluid, and a small opening, the spigot, for admitting the air; (*d*) establishing free ventilation to a foul chamber which normally contains but one natural window. This principle is employed in our sleeping and living rooms when we wish to ventilate. It is always necessary to have two openings, at least, if we want fresh air. (*e*) Establishing an opening in the pathway of a stream of antiseptic liquid ejected from an ordinary douche, thereby enabling the patient to wash out his own antrum by simply douching that side of his nose should it be required. (*f*) The establishment of an opening that will permit of inspection, packing and medication.

The Advantages of this Method Are: The painless operation under local anaesthesia; the lessening of personal risk to the patient; the speedy execution of the entire operation (in one case the operation was completed in three minutes, in another five minutes; ten minutes is the usual time); the operation completed without the necessity of a preliminary turbinectomy, and the cure resulting without the wearing of plugs and plumbing devices.

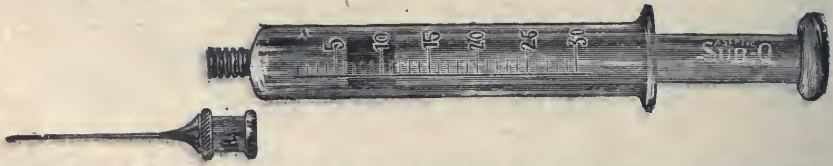


Fig. 2. "This syringe can be boiled without damage to the packing. The needle shown is too short, it should 2 inches long.

Instruments Used: Kramer's speculum, angular packing forceps, flexible copper probe, Krause's probe, angular scissors that will cut well at the end, special hypodermic for the cocain and adrenalin mixture (Fig. 2) special perforating history (Vail's), (Fig. 1) special grooved antral saw (Vail's) (Fig. 1).

The Operation: Having sterilized the patient's nose, lip and nasal vestibule with soap and water bichloride, douched the nasal cavity in front and rear by post-nasal douche, the hairs of the nasal fossa are cut short and plegets of cotton soaked in 5% cocain are packed under, upon and above the inferior turbinated bone. A wait of seven minutes by the watch is allowed, during which time the operator can busy himself seeing that the special aseptic glass syringe is properly sterilized and loaded with equal parts of 2% cocaine and 1-2000 adnephrin. This will reduce the cocaine to 1% solution and the adnephrin to 1-4000. The cotton is withdrawn from the nose and the operative field brushed with 1-5000 adnephrin solution, then the needle of the hypodermic is inserted under the mucous membrane of the turbinal in the site of the operation, which is, be it remembered, not the front end, but the middle third of the turbinate. The solution is driven under the mucous membrane on the lateral wall *beneath* the inferior turbinate, as well as on the convexity of it. In all about 20 drops are injected. As soon as the needle is withdrawn the actual operation begins—no need of waiting. The perforator is passed in the nose point downward toward the floor. When the middle of the inferior turbinal is reached, it is turned directly toward the antrum and thrust through the bony partition under the inferior turbinate by a positive pressure, at the same time forcing the handle of the instrument toward the septal side. When the antrum is entered, the

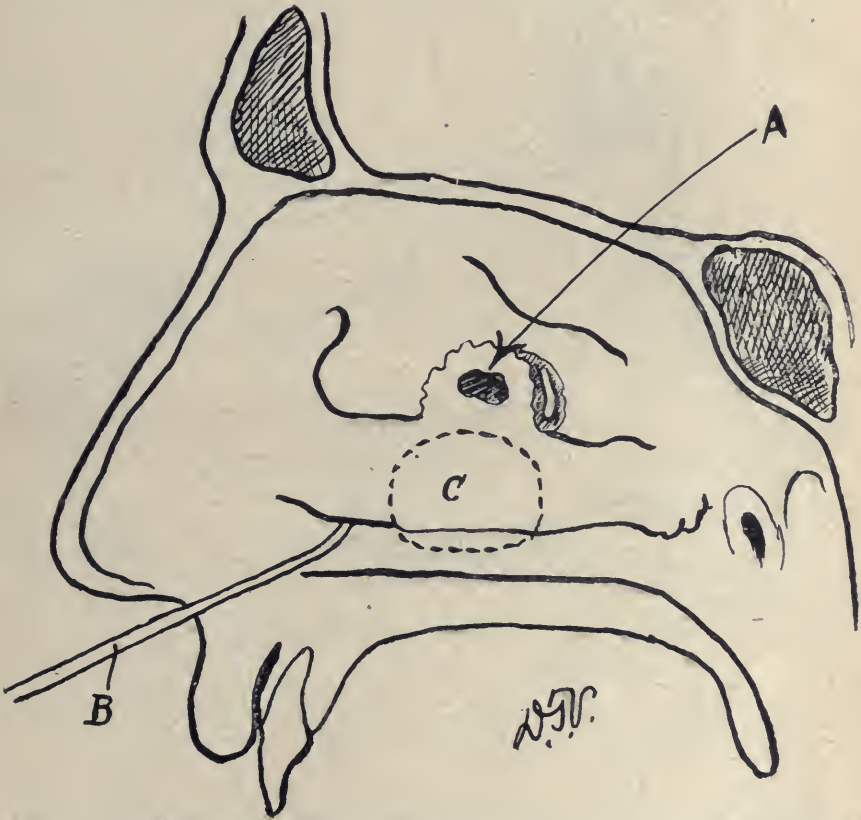


Fig. 3. Showing where the opening is proposed to be made at C. A represents the natural opening; B, a probe pointing to the outlet of the nasal duct.

instrument is forced backward toward the pharynx and forward toward the nasal entrance to enlarge it in order to insure entrance for the saw, which is next used. The saw is inserted well through the slit with the teeth toward the antrum cavity. The tip of the nose is deflected toward the other side by the nasal speculum to permit inspection and a free sweep. The timid operator who lacks the surgical instinct will fail at this point, unless he makes up his mind that there is nothing to fear. The saw is grasped firmly, the patient's head steadied by assistant, and a few bold strokes of the saw, keeping in mind the intent of making an oval opening and causing the saw blade to describe the oval in its course, which it naturally does, coming out where it first started, will render the maneuver successful, even in the cases of narrow nares.

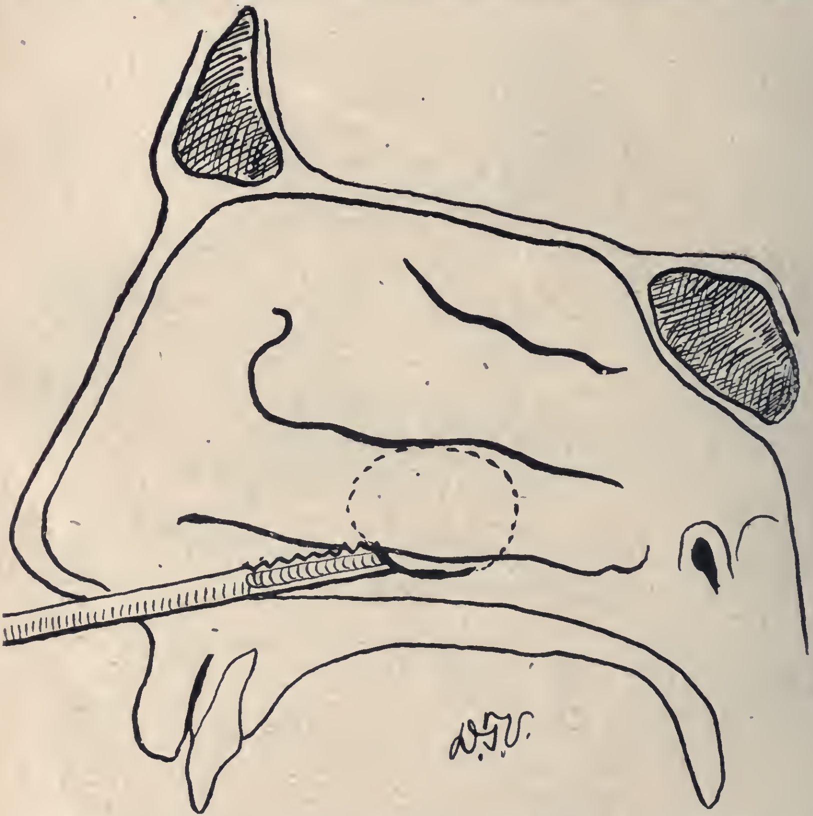


Fig. 4. The end of the grooved saw has been passed through an opening through the antro-meatal wall under the inferior turbinate. The dotted line shows the course it is proposed to take in sawing out the oval button of bone. The saw readily cuts through the turbinated body.

There is usually an over-hanging apron of mucous membrane, which the saw, in its oblique course through the posterior half of the oval, has under cut. This is easily cut away by angular scissors or Gruenwald's forceps. The cavity is now open for exploration with the large probe of Krause. A little aristol powder insufflated will aid the vision in locating the opening. The cavity should be washed out with sterile salt solution and packed with a moist gauze strip, which is easy to do, and the operation is completed. The patient is ordered to wear a cotton plug in the nostril for three or four days to guard against outside infection.

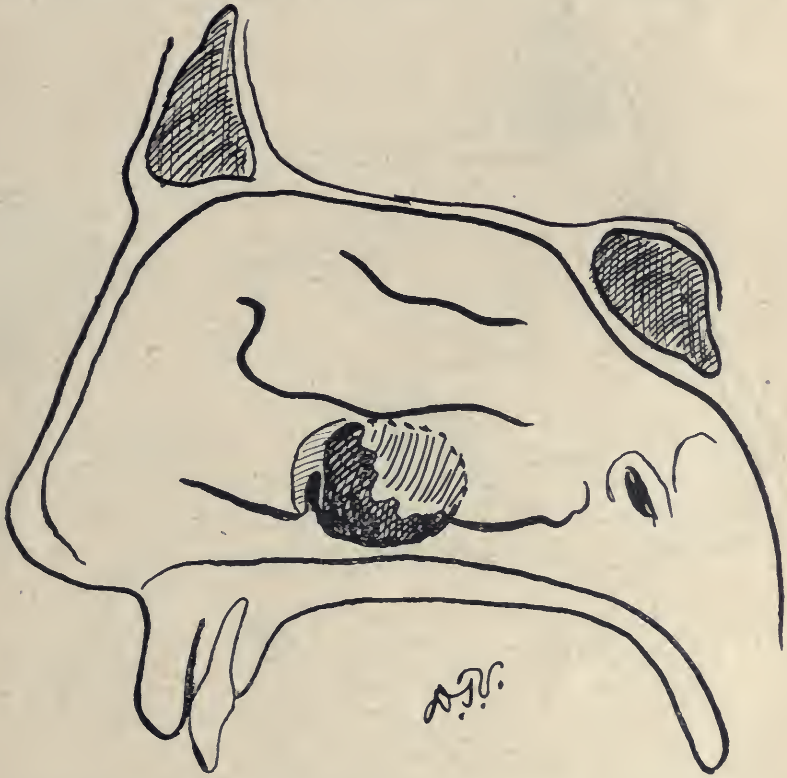


Fig. 5. In sawing out the oval button of bone the mucous membrane of the inferior turbinate has been undercut, leaving an apron of soft tissue which should be cut away.

Should the cavity be filled with polypi and granulations, a condition I have not encountered among the seven cases cured by this method, it can be partly cleared out by means of curettes; but not entirely so, for the front half, at least, is out of the field of curettement. In that case I would not hesitate to inject the cocaine-adnephrin mixture under the mucous membrane of the canine fossa, expose the bone by an incision one inch long, peel back the periosteum, perforate the front wall of the antrum by means of a short, strong knife, and saw out a circular or oval button of bone with the same grooved saw that was used in the intra-nasal operation. This method would expose the antrum to thorough inspection and would, in fact, be a Caldwell-Luc operation with technic reversed.

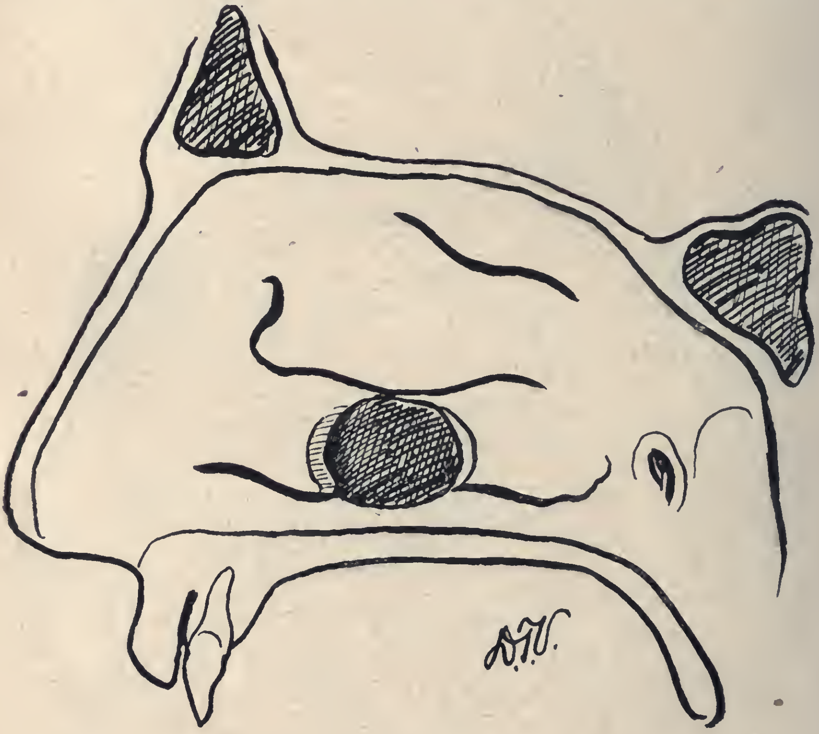


Fig. 6. Showing the relative size and location of the opening in the antrum at the completion of the operation.

I have done the Kuster operation through the canine fossa under local anaesthesia and it was painless.

Pynchon, of Chicago, has preceded me in the invention of a grooved saw. Pynchon calls his a curved saw, and it is of different shape and designed for low spurs. His saw, which is doubtless of great value for the purpose for which it was designed, would not do the work which my saw does in this operation.

The antral saw which I have devised for the operation has a rather wide blade and a shallow groove. The teeth are sharp and should be kept so to work well. It will saw in a curved pathway and return to its starting point.

It will be observed that in this operation it is unnecessary to do a preliminary turbinectomy. The saw will leave the useful front end of the inferior turbinate and take only that part which is necessary to accomplish the success desired. In this way the valuable erectile tissue on the front end of the turbinate is conserved—a thing greatly to be desired, for, be it remembered, the physiological action of this tissue has the analogous action in controlling the entrance of air of varying humidity and barometric pressure in the nose that the iris has of controlling the amount of light intensities which enter the eye. Something has been said about the antrum opening which is made by the intra-nasal operation not being at the lowest point in the antrum cavity. It is true the antrum cavity dips considerably lower when the floor of the nose is horizontal, as in the upright position of the head, but it is such an easy thing to tilt the head to one side and make the nasal opening the lowest point, that I can see no force to that argument. During the sleeping hours, while the patient lies on the opposite side, the cavity would certainly drain out.

I have frequently demonstrated a point raised in the premise of this paper, namely, that the current of water from the douche will find free entrance to the antrum after the operation, for after such an anterior douching of the nose and the fluid has been blown out, the patient will empty a spoonful more by tilting his head, proving the point beyond question.

The sign of a cure is when there is no longer any catarrhal discharge and the nose is clear and free. The continuation of the douche after this point has been reached is to be deprecated, for there is nothing gained by douching a healthy cavity. Moreover, the patient will sooner or later infect his cavity with foul water through carelessness, not to speak of the other dangers of the douche habit. When the cavity is well the patient should be instructed to stop all treatment.

24 East Eighth Street.

RETRO-PHARYNGEAL ABSCESS. REPORT OF SOME UNUSUAL CASES.

BY M. A. GOLDSTEIN, M. D., ST. LOUIS.

The recognition of retro-pharyngeal abscess or lymph-adenitis retro-pharyngealis suppurativa, as it has been proposed to classify it, is by no means of recent origin in medical literature. As early a writer as Galen apparently refers to this affection as of common occurrence in his experience. Morell Mackenzie (Manual of Diseases of the Throat and Nose, vol. II, page 57), refers to the history of the subject as follows:

"The first notice of abscess in the pharyngo-esophageal region dates as far back as the second century of the Christian era, when Galen related a case which had occurred in his own experience and which terminated in spontaneous rupture. From his manner of alluding to the case, it would seem that he had seen several examples of the same kind, most of which had ended fatally. No mention of the complaint was made by any other writer, so far as I am aware, until the middle of the 18th century."

From this period until the early '70s of the 19th century retro-pharyngeal abscess is rarely mentioned. The most classic monograph on this subject was published by Bokai (sr. and jr.), who in an extensive experience at the Children's Hospital of Budapest collected over 500 cases of lymph-adenitis retro-pharyngealis.

It is evident, therefore, that these cases are by no means rare in recent literature, but it is a notable fact that with all of the subject matter at our command, many of the important data have been but imperfectly developed. Neither in the monographs nor in our numerous text books on pharyngology has the question of the etiology of this subject been definitely established. It is especially to be remarked that there is a great scarcity of case reports in American literature, and even in the more extensive monographs, as those of Bokai, Baginski, Henoch, Koplik and others, it is quite evident that most observations in this field have been made by pediatrists and not by laryngologists. The scarcity of these reports in laryngological literature, the obscurity of etiology, the limited subject matter in the text books prompt me to present a report of three unusual cases of retro-pharyngeal abscess with such comments as have been suggested in the observation and care of these cases.

Case I. Baby S., male, aged 20 months, was brought to me two weeks after the onset of an acute streptococcic bi-lateral tonsillitis. The condition had been diagnosed as "quinsy sore throat." The patient was treated by the family doctor who, according to the statement of the parents, did not deem it necessary to confer with a laryngologist. During the course of the treatment the doctor had made two incisions on the right side and one on the left side, and I am constrained to add, several directly into the tissue of the tonsil, to liberate pus from what he thought to be one of the natural sequelae of quinsy, namely peritonsillar abscess.

There is nothing especially worthy of mention to add to this case. I found the pharynx wall markedly bulging. The duration and bulging extended laterally to the tonsils, and these, also, were much enlarged. Externally, the neck appeared quite swollen, and a number of lymphatics could be distinctly outlined. Perhaps there may have been some difficulty in a differential diagnosis between peritonsillar abscess on the one hand and retro-pharyngeal abscess on the other in the early stages of development of this case.

I made a deep incision into the pharynx wall, and liberated a large quantity of pus. The child made an uneventful recovery.

Case II. Baby W., male, age 6 months, was referred to me by Dr. Zahorski and admitted to my hospital January 9th, 1907. Examination developed the following data: Temp. 99.4, pulse 140, resp. 38. Patient breathing heavily, extreme pallor with evidence of beginning cyanosis. The head was bent backward, the child seemingly breathing better in that position. The superficial and deeper lymphatic glands of the neck, the post-auricular and sterno-cleido-mastoid area on both sides were greatly enlarged, the tongue swollen, and the posterior wall of the pharynx showing distinct bulging, infiltration and oedema. The child gave forth incessantly short, hoarse, weak cries, and attempted to maintain the position with the head thrown far back. It had been unable to nurse at the breast for over 24 hours. The patient had been seen by a laryngologist 48 hours previously in consultation with general practitioners. An attempt at an examination of the pharynx had been made, and a portion of the posterior pharynx wall about one-half inch to the left of the median line and above the free margin of the soft palate had been excised with a narrow cutting or punch forceps and submitted for microscopic examination.

The report of the pathologist who examined this specimen within a few hours after its removel was embodied in a brief note to the attending physicians, the substance of which was as follows:

"My dear Doctor: The examination of tissue from the pharynx section referred to me today reveals distinct evidence of lymphosarcoma, and I am very sorry for the little patient."

On the strength of this microscopic diagnosis together with the other clinical evidence determined on examination the physicians in the case made a fatal prognosis, and told the parents that nothing further could be done in the matter. It was at this stage of affairs that the patient was brought to my hospital.

Fifteen minutes after arrival the little patient was placed in a recumbent position on the operating table with the head overhanging the table, and an aspirating trocar plunged into the pharynx through the wound made by the excised section of the pharynx tissue, the trocar being carried well down until the surface of the vertebra could be felt. On withdrawal of the trocar, a single drop of pus was seen about the tip of the canula. I originally selected this site for penetrating the pharynx with the trocar, because of the wound previously made in examination of the pharynx. On noting the presence of even a small drop of pus about the tip of the trocar, I felt positive that more pus would be found. Both on digital examination and on inspection with reflected light there seemed perceptibly more bulging of the pharynx well forward on the right side than on the left, where thus far all examination measures had been carried on.

With a long, slender bistoury, held with its flat surface against the palmar surface of the index finger, and projecting about three-fourths of an inch beyond the tip of my finger, I penetrated the right pharynx wall, cutting from below upwards and making an incision of about one inch in length. This was followed by a gush of pus, and two ounces of thick, greenish-yellow pus were liberated. To insure free drainage, I opened a pair of dressing forceps in this incision, spreading the tissue in all directions, also making firm pressure on the neck on either side.

Several unsuccessful attempts at nursing were made. Four hours after leaving the operating room, the patient took about three drams of mother's milk from a spoon. The throat was swabbed every hour with an antiseptic alkaline solution.

Within 24 hours the temperature dropped to normal, the pulse to 120, and the baby took the breast and nursed with ease. The patient was discharged on the tenth day. The infiltration of the lymphatic glands had all disappeared, and the wound entirely healed.

Case III. Baby R., male, age 9 months, referred to me by Dr. Friedman, and admitted to my hospital December 27th, 1906. Temp. 100.6, pulse 138, resp. 32. The history of the patient's present illness was somewhat indefinite in detail, and extended over a period of some two or three weeks. Treatment had been undertaken by various physicians for bronchitis, grippe, tuberculosis of the neck, syphilis, etc.

The first unusual feature presented in this case was the difficulty of examination. I was unable to make a direct inspection of the pharynx, for every time an attempt was made to depress or draw out the tongue, or, in fact, every time the mouth was forced open, the child began to choke. The neck on the left side was swollen, a number of lymphatic glands could be distinctly outlined and were intensely indurated; an occasional glimpse of the interior of the pharynx presented a swollen condition of the posterior and lateral walls together with that of the left tonsil. Dr. H. W. Loeb saw the case in consultation with me the following day, but no more definite data could be obtained, even after digital examination of the pharynx, because of the patient's tendency to choke. It was decided to postpone further examination until the next day. The throat was swabbed with Adrenalin solution, and Ichthyol applied to the side of the neck. The baby was beginning to nurse with some difficulty.

At 11:30 the night of December 29th, I was called hastily to the hospital, as the child developed rapidly increasing cyanosis. An immediate tracheotomy was decided upon. I performed this operation under Schleich's anesthesia, and it may be of practical value to describe some of the complications that presented themselves during this operation.

I used the Schleich's anesthesia because of the rapidly developing precarious conditions of respiration and circulation. The difficulty and rapidity of respiration, the rapid, thready pulse and clammy skin were all contra-indications to the use of general anesthesia. In fact, the tracheotomy might have been undertaken without any form of anesthesia either general or local, because of the condition of extreme collapse of the patient.

I was prepared to find a small trachea in an infant of nine months, but the unusually small caliber of the trachea in this child, an infant physically well-developed in every other respect, took me by surprise. I had neither tube nor canula small enough to introduce into this infantile trachea, and my assistants patiently held open the edge of the tracheal wound with hooks and bent hairpins while I racked my brains for a solution of the problem. During my visit abroad, last season, it was my privilege to see much of the splendid neck surgery of Mr. Henry I. Butlin of London. Among the practical devices which I saw used by this resourceful surgeon was an adjustable metal flange, intended especially for use in combination with soft rubber tubing in similar emergencies. I cut a piece of No. 10 velvet rubber catheter 1½ inches in length, adjusted this to the flange and placed it in position in the trachea. After several coughing paroxysms the patient began breathing through this improvised tracheal canula, and it was maintained in position for 48 hours. On several occasions the tube was dislodged suddenly by paroxysms of coughing, but was immediately replaced.

An unusually excessive secretion of mucus about the tracheal wound and in the tube was noticed, due either to the presence and irritation of the rubber tubing in the trachea or to active inflammatory changes in the pharynx. We experienced much difficulty in keeping the tube free of mucus. At first we resorted to sterilized feathers which were introduced into the tube; but the coughing paroxysms which followed were so severe that the tube was dislodged at almost every such attempt. The caliber of the rubber tubing was so small that but little inspired air could be exhaled by the patient unless the tube were kept constantly clean. I had never been partial to the use of feathers as a means of cleansing the tracheal canula, and I was indebted to an ingenious suggestion of my assistant, Dr. W. M. C. Bryan, by means of which we succeeded in keeping the tube clean and pervious in a more aseptic manner. A piece of medium-sized tempered wire about six inches in length was brought into service as an applicator, looped at one end for a handle and provided at the distal end with a long, narrow loop and a tiny hook, about which absorbent cotton was tightly twisted. The purpose of the hook at the end of the applicator was to prevent the cot- so penetrating that for several months after the patient had been ton from slipping off while in use. Several dozen of these applicators were prepared aseptically, and proved a valuable and sufficient substitute for the time-honored feather. When they were once used, they were laid aside, the cotton burned off, and the wires again wrapped with cotton were ready for use.

Immediately following the tracheotomy and the insertion of the tube, the cyanotic symptoms disappeared. The temperature still fluctuated between 103 and 105 with the usual septic curve. The pulse varied from 170, twelve hours after the tracheotomy, to 140, one hour before the retro-pharyngeal operation three days later. Respiration from 32 to 50. At 10 A. M. on the day of the tracheotomy the baby took the breast without much difficulty, and continued to nurse at intervals of three or four hours until shortly before the time of opening the retro-pharyngeal abscess, when it refused to nurse.

The patient was watched constantly, day and night, and especial stress was laid on maintaining the tube in position, as with every spell of coughing the soft rubber tube was in danger of being kinked and forced out of the tracheal wound. On the second day following the tracheotomy, an aluminum canula was in readiness and was substituted for the rubber tube. The patient began at once to breathe more freely, the secretion of mucus was lessened in quantity, the tube was more readily cleansed and more easily maintained in place. The child's physical condition was now sufficiently improved to warrant a more exhaustive examination of the pharynx, and while no distinct fluctuation in the pharynx wall could be obtained, the bulging, temperature, and other clinical data all warranted the diagnosis of retro-pharyngeal abscess.

At noon on December 31st, three and one-half days after the tracheotomy had been performed, I made a deep incision with a bistoury, guided by my finger into the left posterior pharynx wall, and liberated about two ounces of pus, burrowed deeply under the pharynx muscles. I dilated the wound with my finger, and an assistant made firm pressure on the neck inwards and under the ramus of the jaw. The head of the patient was held downwards and backwards to avoid the possibility of pus finding its way either into the trachea or the esophagus. The draining of the pus immediately relieved all tension and swelling in the neck and glands.

At 6 P. M. I made a similar incision of the pharynx wall to the right of the median line, again evacuting about two ounces of pus mixed with blood. At midnight the temperature had dropped to 99.8, pulse 140, resp. 36. The patient slept well nearly all night, waking at intervals of two hours, at which time the tube was cleansed, and the baby nursed. The aluminum canula was maintained in position until January 20th, a period somewhat over three weeks.

In so young an infant, where the respiratory tract is of necessity unusually delicate, and where even slight irritations are very likely to produce unfavorable complications, I wish to emphasize the importance of a therapeutic measure, the value of which I was well able to observe, especially in this case. In many clinical reports of children under one year of age, where a tracheal tube has been maintained for a protracted period, fatal results have ensued of septic bronchitis or pneumonia. In the compound tincture of benzoin we have a valuable agent to prevent sepsis in the lower breathing tract and to soothe the irritated and inflamed mucous membranes in the post-operative treatment of this class of cases.

In this particular case, compound tincture of benzoin was vaporized freely and constantly in the bedroom. I used vaporizing apparatus with a conical tip, and every few hours had the vaporizer brought to within two feet of the patient's throat and the vapor directed specially to the tracheal tube for ten or fifteen minutes at a time. Nor was this precaution of benzoïn vaporization relinquished at any time during the conduct of the case. I insisted on the room being constantly saturated with this medication. This vapor was discharged from the private room of the hospital, the smell of benzion was very apparent, though the room had been daily ventilated.

Tracheotomy has become so common a surgical procedure that its technique and the simple conduct of the operation require but little comment. It is the after-treatment of these cases which frequently taxes the resourcefulness and ingenuity of the surgeon to his full limitations.

There was another condition associated with this case that may be worthy of comment. When the retro-pharyngeal wound had healed, and all swelling and oedema about the larynx had disappeared, there was no further cause for maintaining the tracheal canula in position. On withdrawal of the tube we found that another change had taken place. The child was unable to use its voice. When the tracheal opening was plugged up and the child made an effort to cry, there was a peculiar, hoarse, whistling sound as of air passing through a tube of narrow lumen, the upper part of which was rigid. I advanced the opinion, concurred in by my colleagues in the case, that this loss of voice was due to a deflection of the natural axis of the trachea and larynx. The intense infiltration of the tissues of the pharynx, the marked bulging of the musculature of the pharynx walls, the maintenance of the tracheal canula in a rigid position in an infantile trachea for a period of over three weeks, all contributed their share to throw the larynx or the chink of the glottis out of position in their relation to the axis of the trachea. The column of air in the trachea did not strike the vocal cords direct, but was impinged and deflected from the unnaturally curved walls of the trachea. I was making every preparation, on the second day following the withdrawal of the tube, to insert an intubation tube into the larynx, with the hope of gently forcing the trachea and larynx toward their normal axis, when slight vocal sounds were noticeable in the child's efforts at crying. These greatly improved, and by the time the tracheal wound had healed, a perfectly normal vocal function was re-established.

I have selected the above three cases because they offer in their diagnosis, variations, clinical data, technique, and post-operative treatment and sequelae many valuable object-lessons which are but seldom and but briefly described in the literature of this field.

In Case I, we meet with a condition that is more frequent than a cusory glance into this brief report might indicate. It is very likely that many cases diagnosed off-hand as quinsy, frequently followed by peritonsillar abscess, have in reality proven to be cases of retro-pharyngeal abscess. Perhaps it is difficult, in the early stages of infiltration about the fauces and the rapid induration about the soft palate, which is the typical picture in peritonsillar abscess, to sharply differentiate this condition from pus-formation posterior to the pharynx muscle. At times the pus focus is so deeply buried behind the muscles of the pharynx wall that it is practically impossible, even in the later stage of retro-pharyngeal abscess, to detect the presence of pus by palpation, for the pharynx muscle is so thick and so indurated that no fluctuation is perceptible. This was apparent in each of the three cases above cited.

From the literature of retro-pharyngeal abscess at our command, it is a noteworthy fact that nearly all cases which have been reported have been in children under five years of age. It occurs somewhat infrequently in older children, and with extreme rarity in adults. If we exclude from our etiological consideration the small proportion of tubercular and syphilitic caries of the vertebrae, we must still account for the causative factor in the great majority of these cases. Why should retro-pharyngeal abscess occur so frequently, in the opinion of nearly all observers, in very young children, and why should this affection occur with increasing rarity, the older the patient? We know that in early childhood there is an unusual activity of the lymphatic ring and of the lymphoid tissue in the pharynx, and that there are several small, deeply located lymphatic glands imbedded in the connective tissue of the posterior pharynx. It would be logical to assume, therefore, that whenever an acute infectious process takes place in the nose, nasopharynx, accessory sinuses, ear, tongue or larynx, a continuity of lymphoid tissue may readily carry such an infection into the depths of the pharynx walls. If the presence of this lymphoid tract in the pharynx areas is accountable for the frequency with which retro-pharyngeal abscess occurs in very young children, than the scarcity of its occurrence as the age of the subject advances may also be conversely proven, for, with adolescence and maturity, the lymphoid tissue which is so great a productive agency of hypertrophy or disease of any part of Waldeyer's ring greatly atrophies, and the pathology depending on this tissue is of necessity lessened.

Lymph-adenitis retro-pharyngealis *without* pus-formation is of rather frequent occurrence. The active stimulation of the lymphatics, the liberal distribution and wide radiation of the lymphatic glands in the pharynx itself and the susceptibility of young children to catarrhal inflammation of the mucosæ of the upper respiratory tract substantiate the conclusions of such observers as Bokai, Baginski and Kormann, that in a large preponderance of patients so affected an enlargement of the post-pharyngeal lymphatic glands could be determined. In the early nomenclature of this affection retro-pharyngeal lymph-adenitis was classified either as idiopathic or as symptomatic. With the development of a clearer understanding and appreciation of the physiological and pathological importance of the lymphatic ring in its relation to affections of the pharynx, it is evident that a revision of this nomenclature could be made. While it may not be possible in each and every instance to definitely ascertain the first focus of infection, the culminating point of this affection may always be traced to an inflammatory or septic condition of the retro-pharyngeal lymph nodules. In a sub-classification, therefore, of this field, instead of referring to an idiopathic or symptomatic form, it may be more logical to consider retro-pharyngeal lymph-adenitis either as inflammatory or suppurative.

Case 2 presents another valuable object lesson. The clinical picture of this pharynx must have been very misleading, for it prompted the consultant in the case to consider the possibility of a malignant neoplasm and to remove a section of tissue from the bulging, indurated pharynx wall and submit it for microscopic examination. I can appreciate the hesitation of this laryngologist to offer a definite diagnosis without microscopic verification, for the tissue was dense, the swelling fairly circumscribed, and no other clinical data were apparent. The pathologist is the one who, in this case, might be open to criticism, not so much because of his error in the diagnosis of the microscopic section, but because of his positiveness in maintaining the diagnosis irrespective of any other data, and thereby misleading the clinicians engaged in the case. It is not difficult to understand how a diagnosis of lympho-sarcoma could be made in the case under consideration. The induration and swelling of the pharynx muscle and the natural distension of the fibres of this tissue, together with the infiltration of lymph cells in the course of such an active inflammatory process, in a section taken parallel to the muscle fibre of the pharynx, might readily present a picture under the microscope similar to that of lympho-sarcoma.

If the pathologist, however, were in closer touch with the clinician,, and were informed of the clinical aspects of the case, of the induration and swelling that had taken place in the tissues, and the location and direction of the section which had been removed for microscopic examination, it is possible that such error might have been avoided. This experience simply emphasizes our position that, where a microscopic examination is called into question, it is a dangerous policy to offer a diagnosis based exclusively on such microscopic findings. The value of the microscope and of our pathological information can only be best developed when applied in conjunction with an intelligent understanding of the clinical data furnished in a given case.

The technical difficulties developed in the few cases which I have presented only serve to illustrate to what extent the ingenuity and mechanical skill of the operator may be taxed. The instrument catalogues present various forms of a combination bistoury and forceps for incising and draining retro-pharyngeal abscess, and yet there is nothing more serviceable than a slender, sharp, pointed bistoury, guarded and guided by the index finger of the operator.

A recent writer advocates that the patient, during operation for retro-pharyngeal abscess, be held in an upright position in the arms of an assistant, and the head well thrown back—a position similar to that frequently preferred for adenoid operation. This position of the patient seems illogical to me, especially where a large quantity of pus is likely to be liberated, for as a large proportion of these cases consists of young children who are unable to assist in expectoration or to co-operate with the surgeon by following his directions, it is possible that some of the pus might find its way into the trachea, causing septic inflammation of the bronchi or lungs. To obviate this, I direct the assistant to hold the patient flat on the back with the head overhanging, so that the outflow of liberated pus may be easily controlled.

The tracheotomy undertaken as an emergency in Case 3 is a step which, fortunately, is not often necessary in this class of cases, for even under most favorable circumstances tracheotomy in such a young subject is a delicate and difficult technique, and the prognosis usually bad.

The incision of the pharynx wall should be free, deep and long, and the operator should observe the precaution to remain near the median line with the bistoury, so as to avoid wounding the internal carotid artery. Both in retro-pharyngeal and in peritonsillar abscess I make it a rule to introduce a pair of slender uterine dressing forceps into the incision and to spread the blades as wide as possible to break up any septa containing pus sacs and to enlarge the drainage areas. In one of my cases a second incision was necessary in the opposite wall of the pharynx, and I attribute this to the fact that the drainage following the first incision was imperfect.

I have used the data of these recent cases to bring out some of the features of retro-pharyngeal abscess that have either not been mentioned or have been but briefly touched upon in the literature of the subject. With our increasing knowledge concerning the physiological and pathological importance of the lymphatic system and its relation to many of the diseased processes which we encounter as laryngologists, the subject of retro-pharyngeal abscess will, no doubt, be more prominently considered.

3858 Westminster Place.

The Reduction of the Tip Tilted Nose. C. C. Miller, (Chicago.) *Med. Fortnightly*. July 10, 1907.

The author begins by stating that the public is deeply interested in the methods to improve the appearance of the face, as shown by the conspicuousness of the "beauty columns" of the newspapers. He aims to interest conscientious, ethical physicians and surgeons in cosmetic work, so that it may be taken from the charlatans who control it today. This is largely due to physicians ridiculing any suggestion of an operation for improving the appearance, and after a time the sufferer quietly consults the advertiser.

The operation for tip-tilted nose, the author states, is performed without difficulty after the parts have been infiltrated systematically so that none incised are uninfiltrated. The solution used is not of material importance; it should contain a trace of cocain or similar agent. He gives a simple, clear drawing to illustrate his operation, and to it and the short description the reviewer must refer the reader.

Eaton.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, November 27, 1907.

THOMAS J. HARRIS, M.D., Chairman.

PRESENTATION OF CASES.

A Case of Post Operative Cleft Palate. By W. W. CARTER, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

A Case of Congenital Palate Recently Operated Upon. By JOHN LESHURE, M. D.

This boy, about 7 years old, was operated upon about two months ago, and the case is presented to demonstrate some points in the operative technique, as well as features of the after education of these defectives to be mentioned later by Dr. Scripture. His personal and family history are devoid of interest. The cleft palate was a rather wide one, beginning about half an inch behind the incisor teeth and extending symmetrically back through the uvula. Posteriorly it measured about three-quarters of an inch in width, narrowing somewhat toward the front. The child was not a mouth-breather, although a considerable amount of adenoid tissue occupied the naso-pharynx, and he had the usual defects of speech. The adenoid tissue was not removed, for reasons to be mentioned later.

The operation was done under chloroform anaesthesia, induced by means of this apparatus (demonstration) familiar to us all. Its use saves a great deal of time, allowing as it does, the continuous administration of the anaesthetic. I have here a reprint of an article by Dr. Charles H. Peck, of this city, published in the Annals of Surgery, January, 1906, which admirably illustrates the steps of the operation, and I will not take up your time in going over them, further than to speak of one point which seems to me to be the critical point of the operation. After the flaps have been elevated and the palatal muco-periosteum has beeen divided so as to separate it from the nasal mucous membrane, the soft palate falls away somewhat from the nasal floor. The freshened edges are still held apart by the levator and tensor palati muscles, as well as the palate-glossus and palato-pharyngeus. By placing the tips of the fingers in the posterior portion of the lateral incisions a sort of dry dissection and stretching of the muscles can be carried out, which usually relieved tension sufficiently to allow of satisfactory coaptation of the parts. Complete division of these muscles is thus rendered unnecessary. These palates are often quite inflexible and do not completely shut off the naso-pharynx from the pharynx. It is for this reason that I believe the adenoid tissue should be left in situ unless greatly hypertrophied, as it forms a sort of shelf, meeting halfway, so to speak, the velum, and rendering possible better pronunciation of the palatal consonants.

The sutures and final packing were removed on the tenth day, and that practically ended the treatment.

Case of Carcinoma Developing from a Chronic Leukoplakia Buccalis. By Joseph H. Abraham, M. D.

A Case of Epithelioma of the Larynx, After Being Well for Six Years, Has a Growth of Doubtful Pathology on the Opposite Cord. By R. C. Miles, M. D.

Dr. Myles said that he had already reported this interesting case before the American Laryngological Association and the Tri-Ological Society. In 1901, this patient had applied to him for treatment for a rather extensive growth on the left vocal cord, near the processus vocalis. This was removed in one sitting. The growth was hard, and, his brother being a physician, Dr. Myles gave him the specimen which was submitted to a distinguished pathologist for examination, who reported that it was an epithelioma. Dr. Myles then proposed a plan of thyrotomy, but the patient declined operation for reasons of his own; and instead of developing further, the growth disappeared and did not recur. He was examined last year and there was no appearance of any lesion. The present lesion is on the right cord, the other was on the left. The present growth is soft and has a whitish appearance. The sputum has been examined for bacilli, with negative results. Iodide of potassium has been tried, but has had no definite effect. Dr. Myles said that he would remove a piece from the larynx and report the result later.

The case was most interesting from a pathological standpoint, and in regard to the question of the curability of cancer. If he had cancer before, it has been well for six years. The present growth does not seem to have any relation to the former one.

Microscopic Findings on Two Laryngeal Cases. By T. J. Harris, M. D.

Dr. Harris reported the microscopic findings on the two laryngeal cases presented by him at the last meeting,—one a women with a chronic papilloma of the anterior commissure. The growth was removed and was reported by Dr. Wright to be a hard variety of papilloma. The second case was a patient with a growth on the right cord. The report in this instance showed an area of edematous connective tissue covered with squamous epithelioma, the site of an acute inflammatory process.

Dr. Harris said that it was hoped that this plan of making complete and late reports of the cases presented could be carried out, so that the section would have full information concerning them.

Researches on the Voice with Demonstrations of the Methods of Recording and Analyzing by the Phonograph, Gramaphone and Graphic Apparatus. By Prof. E. W. Scripture, M. D.

To be published in full in a subsequent issue of The Laryngoscope.

DISCUSSION.

Professor Hallock said that he felt something like the man who was walking down 23rd Street looking up at the Flat Iron Building when an automobile ran over him. He was not entirely killed, and got up and was pulling himself together when the chauffeur said to him: "You ought to look out." "Gee!" replied the man, "you are not coming back, are you?" He only hoped that Prof. Scripture would not come back over him, or he might be finished on the return trip. Of course, as a physicist, he represented the Helmholtz side of the question rather than the later one. He expressed his unqualified admiration for the quality and quantity of the work done by Prof. Scripture on this subject. The larger part of the work is work which is very little affected by any theoretical interpretation put upon it. It is work of fundamental importance. The main thing here is that we know certain things about the records of the voice; and with the great majority of the work he had no difference of opinion with Prof. Scripture. He does not, however, agree with him on the question of the tone quality of the voice and its origin. With reference to the *variety* of the vowel sounds in the human voice he is perfectly ready to substantiate anything Prof. Scripture has to say.

A number of years ago he himself had tried a comparatively simple problem of analysis of the vowel sound produced on a uniform pitch, having no facilities for studying the methods of attack or finish of the vowel, but simply the middle part sung by a professional singer whose business it was to keep on a pitch. He had tried to analyze these sounds, and tried to get out of the records which were made, some clue as to what is the proper vowel sound that Prof. Scripture referred to. He could make records of the same individual, and the same vowel as sung by the same individual any number of times, and obtained practically uniform analyses. The individual would sing *a, e, o,* for instance, and these sounds were analyzed with a considerable degree of accuracy. The vowel *ah* for instance, differs as much from the same sound in another voice as *ah* and *oh* in the same voice.

One very important point on which he does not agree with Prof. Scripture is that the soft palate should close off the nasal cavity. When speaking of normal vowels, Prof. Hallock's idea is that in general the soft palate should be completely free and down. The difference is marked, and can be emphasized very easily. If you give the vowel the least nasal twang, you are bound to have the soft palate down. Have a hard vowel and the palate is against the roof of the pharynx.

Again the question is as to what is the correct vowel? Prof. Scripture has apparently taken the scientific way to get at it, and as far as that is concerned he is better able to judge than I for he has analyzed many vowel sounds and has reached certain conclusions.

With regard to the origin of the tone quality: We get a certain quality which, as Prof. Scripture has said, is resolvable. Any voice curve that you may conceive of is resolvable into a series of so-called simple curves. That is true. The light of the sun is resolvable into the spectrum, which we recognize now is a practically indefinite number of different rates of vibration—colors, as we call them. The present idea is well represented in the theory of light, which is that what we call white light, what comes from the sun, did not originate in the sun, as a collection of an infinite number of light "tuning forks," so to speak; that there was nothing there that had vibrated with that complex rate, and that they all came to us in their particular way.

If you take the case of the reed pipe, the striking reed comes down and shuts up the cavity completely every time it lets through a puff of air. The vocal cords close similarly. The "free reed" does not strike the sides as it cuts off the puff each time. The two forms of reeds are made to allow puffs of air to come through. It is the quality of these puffs of air which differs very considerably, and the thing to consider is the possibility of resolving the puff of air into its various components.

Prof. Scripture does not approve of the analysis into the 1, 2, 3, 4, series. He says "Why should there not be in-harmonic tones in the voice?" and proceeds to conclude that there are. Professor Hallock said that he did not know exactly why, and was not sufficiently familiar with that new theory to say why they should come in a 2, 6, or a 3, 9. If one is going to put them in arbitrarily, there is no reason for stopping. You can say 2, 5; 7, 6; 9, 3; etc.—so that as far as that is concerned you can get out of a given curve almost any series of components. In his own analysis, he did not find one of these intermediate inharmonic tones, although they hunted for them. There were no other tones than the 1, 2, 3, 4 tones, and none other were found. There was no trouble with the vowel *ah*, particularly if it had a nasal twang. There was no trouble in finding the regular series of 1, 2, 3, 4, over-tones. The resonators were tuned all through these spaces and nothing was found between, so far as the question of resonance was concerned.

The behavior of the resonance cavities is an old subject concerning which music teachers and voice authorities have argued for many years. It is not fair to compare the action of the lining of the mouth and nose cavities with a lining of wet cotton. That is very different from the lining of the mouth, even the cheeks and the surface of the tongue. You are all familiar with the surface of water itself. If you apply force, gently it will yield readily. On the other hand, it will reflect sound very readily, as well as a solid surface.

Prof. Hallock said that as a person who has had some of the laws of mechanics hammered into him for many years, he could not bring himself to understand how a series of unrelated puffs can continue a vibration in a resonator, the resonator having no relation in its pitch to the puff. He was familiar with the examples given this evening, but when you strike the cheek with the hand that is a complex puff. One of the fundamental theories of vibration is that in order to have one vibrating system set another in motion, either system No. 1 and system No. 2 must be in perfect resonance or they must be attached together, and system No. 1 must be so powerful as to overpower the natural vibration of the other. Having this in mind, he cannot understand how puffs of air coming through the larynx are going to set the air in the resonance cavities into vibration at an arbitrary unrelated pitch.

With reference to the control factors in the larynx, the pitch—the reply of the other side is that the same thing, the control of pitch, of the string, will be the thing that controls the rate of vibration of the vocal cords, or whatever you call them. Of course you have in the larynx the means of control through the tension by the cricoid cartilage and the shortening of the vocal cords, by the rotation of, the arytenoid cartilages, and finally the contraction of that vocal muscle running along the back of the vocal cord or pad. The muscle ends further toward the edge, and the more tensely that is contracted the less of the cord is free to move.

Of course all these factors may be said to affect the pad, the same as the cord. We have fortunately a number of cases that enable us to separate the two things rather distinctly. The original source is in the larynx necessarily. There is little doubt of that, and it would be pretty surely evidenced by the case of the man who very conveniently cut his throat over the top of his larynx, and the operating surgeon seeing that he was in no danger, amused himself by putting a piece of pasteboard in the cut and talked to him, and he produced sounds underneath. We had a case in Wurzburg of a man whose larynx was removed and who talked with a little reed, though he had no control over the pitch. So we have no quarrel on the point that the disturbance originates in the larynx and the articulation modification is in the mouth and cavities.

Prof. Hallock said that he felt guilty in contradicting Prof. Scripture, for he was not in a position to even try to present his evidence at the time, but it seemed only right to present the Helmholtz side of the subject. As one who was on that side, he would be very glad to be convinced, and perhaps when some difficulties are removed he may be. At present, he is in a receptive state.

Dr. H. L. Swain said that the little he understood of the subject, he had learned when at Yale. Prof. Scripture began to study the question of the production of speech. He felt quite sure at that time that Prof. Scripture would discover something, and now was convinced that he had done so. Having had no other theory to go upon, we have all naturally based our ideas upon the Helmholtz theory. Prof. Hallock still speaks of the singing vowel rather than the spoken vowel. There is a well marked difference between these two. He hoped that Prof. Scripture would tell us wherein lies the difference between the sung *ah* and the spoken *ah,* and in what way we can get a tangible idea of its exact nature. When as laryngologists, we understand the difference between speaking and singing perhaps we can formulate some rules and regulations which will assist us in producing a system of voice culture that will apply to all, and will give us ample means of overcoming the difficulties which persons with fine voices have in retaining them through years.

One point upon which we are very deficient is a clear understanding as to the difference betweeen Prof. Scripture's "puff" theory and that of Helmholtz, when he says "there is no necessary connection between the pitch of the resonance cavities above the vocal cords and the chord-note." We have always supposed that the two must be in harmony according to the Helmholtz theory. Is it not possible that in singing we make the resonant cavities harmonious with the tone taken by the vocal cord? Do we not train our cavities to mould the sounds in such a way that they shall be strict overtones of the note taken by the chords in singing? When we talk we might not have to do this. Therein would exist at least one difference between singing and speaking.

Prof. Hallock does not see how a current of air through the chambers will not harmonize with the tone produced by the cord. The old boy trick of imitating a frog produces by the same current of air two different sounds which can be harmonic or inharmonic as one wishes, and we can make the whistle and have the cords vibrating in the same chamber harmonic or inharmonic as we please. It explains cases where we remove the larynx and have no connection between the chest cavity and the mouth, where the larynx is entirely removed, and the floor of the mouth cuts the trachea entirely off from the nose. The hissing of air from the separated tracheal opening modified by the position of the lips, tongue and cheek with the air taken in to the mouth enables a person without a larynx to make himself audible in this very room, from near the rostrum, to where I am, toward the rear. He could make a clear and definite sound that could be understood.

He also hoped that Prof. Scripture would have something to say about the use of the lips when we play a horn trumpet, or cornet. There the lips are pressed together tightly as we puff into a chamber of a vibrating character—trombone, cornet or French horn, as the case might be. The same sort of puff producing the widely differing musical tones according to the nature of the vibrating cavity. That is a demonstation of the "puff" theory, as Prof. Scripture has laid it before us. He had read what Prof. Scripture has written, had thought it over, and felt that in the "puff" theory there has been made a distinct advance in the study of speech and spoken vowels, and that we will thereby eventually come into a saner conception of voice training and culture.

Dr. Delavan said that being a physician and not a physicist he greatly appreciated what the physicist has done in general for the physician, particularly in this department of research. While the matter is far too technical to be discussed intelligently by most practitioners, they could all enjoy Dr. Scripture's lecture and his very ingenious demonstrations. He firmly believed that the work done by Dr. Scripture would prove of important practical value, and he expressed the hope that the principles advanced by him might be the beginning of much useful progress.

Mr. Emerson, of the Columbia Phonograph Co. said that he had come this evening to listen and with no idea of speaking, but felt that he would like to offer Prof. Scripture the facilities of the Columbia laboratory, where thousands of records are made every year, and they would welcome him or any other member of the Section who wished to pursue studies along this line of work. The instrument Prof. Scripture uses is somewhat different from that used by the Columbia Phonograph Co., and they would be glad to have him try their method.

Dr. Scripture, in closing the discussion said that he and Prof. Hallock had begun their differences of opinion on this subject about ten years ago, and Dr. Swain had possibly hit on the cause of the difference. His work has been practically entirely confined to study of the speaking voice, so he could not answer Dr. Swain's question as to the nature of the voice in song. It was only six weeks ago that he had started a machine on the singing voice, and he was now working systematically to solve its nature. As to the speaking voice, he is certain that his position cannot be questioned.

The Relations of the Dental Arches to Pathologic Affections of Naso-Pharynx and Adjacent Parts.* By E. A. Bogue, M. D.

Adenoids were only discovered a little more than fifty years ago. Teeth are found among the oldest remains of prehistoric man, yet the proper, normal arrangement of human dental arches was discovered less than twenty-five years ago. The intimate relation between these two discoveries has just begun to be understood.

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* Read before the New York Academy of Medicine, Section on Laryngology and Rhinology, February 27, 1907.

For discussion see April number, 1907, page 317.

I desire in this paper to show that, in the great majority of cases, so far as I can learn, the causes which produce adenoid growths, are the same that produce narrow maxillary arches, and the converse is also true. What produces narrow maxillary arches will generally produce adenoid growths. This is admitting the presence of lymphoid tissue in all children at birth, and the possible demarcation of the tonsilar ring more accentuated at certain times than at others. But it is *not* admitting that every child has adenoids at birth. It is not until the lymphoid tissue has become hypertrophied, and thus pathological, that the term adenoids or lymphoid growths may be applied.

Next I want to show that, if taken early, say at about the sixth or possibly the seventh year, the correction of irregularities in the positions of the temporary teeth corrects impending irregularities in the permanent teeth and that process results in not only an enlargement of the dental arch, but so far as is now known, in a straightening of the nasal septum, lowering the high vault of the palate through the lateral spreading of the upper maxillary arch, and a consequent enlargement of the nasal passages and inferentially of all the adjacent bones of the face, nose and head. This enlargement of the nasal and post nasal passages precludes, so far as my experience goes, and so far as I can learn, all recurrence of lymphoid growths when once they have been eliminated.

I want to show, in the third place, that diagnosis of impending irregularities in and among the permanent teeth, is almost as clear at six years of age, while the temporary teeth are still in the mouth, as at twelve, when the permanent teeth are visible. I wish to show that operations for rectifying the conditions above mentioned, are more safely performed, with less pain, with apparently less general disturbance to the nervous system and more quickly than at any later period in life.

That these operations, performed thus early, are more likely to remain permanently successful than if done at a later period and that they have an influence which we can but little appreciate upon the permanent well being of the individual in after life. Vocalization, enunciation, mastication and breathing are brought nearer to perfection than they could otherwise be; and the personal appearance is made much better. All this makes a more efficient citizen.

When irregular teeth and narrow dental arches are found, with the characteristic physiognomy associated with adenoids, we expect in nearly all cases to find not only nasal stenosis, but that the irregularity of the teeth is in proportion to the degree of deflection in the nasal septum, and diminution in the nasal passages. In all the skulls examined, a pronounced deflection in the nasal septum was invariable accompanied by an irregularity of the dental arches, greater or less according to the deflection of the septum.

As the etiology of narrow dental arches and lymphoid growths seem to be identical, they are associated in our consideration of them.

All babies, not deformed, at first sleep with their mouths shut and breathe through the nose. Some influence causes an inflammation of the mucous membranes of the nose, the inflammation extends to the naso pharynx, a thickening of the lining of the air passages results, and the child has to keep its mouth open to breathe until at last it has a chronic rhinitis, and the child becomes a mouth breather.

The membranes have become thickened by the inflammatory action and its sequelæ into the fungous growth of adenoid vegetations, and at once there is an arrest in the further lateral development of the upper maxillary bone. The cysts of the permanent teeth remain bunched in their insufficient spaces, and year after year goes by with scarcely any perceptible variation in the width of the upper jaw. The constant breathing through the mouth, the absence of the necessary stimulus of breathing through the nose, the lack of the absorbing qualities of the passing air and the dragging influence of the muscles all combine to keep the arch of the jaw narrow. Worst of all, mouth breathing causes the withdrawal of the muscular pushing tongue from its place in the roof of the mouth, where by the growth and constant pressure of that tongue the lateral growth of the upper jaw is promoted.

The statement that the tongue within, and the cheeks and lips without, are the main instrumentalities in the formation of the dental arches from the early stages of embryonic life, right on until maturity, is not by any means new; yet few practitioners realize the muscular and mechanical power of the tongue. A few days since I undertook to prevent a lad of ten years from placing his tongue over a tooth that I wished to examine. Three fingers and my thumb holding a mouth mirror were unable to control its movements.

This muscular tongue, when the mouth is closed, lies against the roof of the mouth, and as it grows, its enlargement laterally presses the dental arches outward, and so enlarges the upper jaw to its proper size, as well as the lower jaw or mandible against which it is always pressing. The withdrawal of the tongue not only allows the arch of the jaw to remain narrow, but it causes the eruptive force of the teeth to be expended in an antero-posterior direction, almost to the exclusion of the lateral growth, from the time mouth breathing is established to the time that relief is afforded by surgical means.

While the adenoid operation in cases of narrow arches is not always successful in restoring nasal breathing, it is never successful in restoring the harmony of the features, the power of correct articulation, or the power of thorough and normal mastication. This requires a special operation, an expansion laterally of one or both dental arches, and a bringing into articulation and so far as possible into regularity all mal-articulated teeth. A. A.

Alypin and Novocain. M. RUPRECHT. *Monat. f. Ohrneh.* May 1906.

After lengthy and detailed account of a large experience with these new anæsthetics, the author arrives at the following conclusions:

1. Novocain is less irritating than alypin, but its anesthetic power, when applied to the mucous membranes is so small as to be practically useless. For hypodermic use it is an ideal anaesthetic when combined with suprarenin.

2. Alypin and supranenin is fully equivalent to cocaine or cocaine plus suprarenin. Alypin is less irritating and less poisonous than cocaine; secondary hemorrhages are less apt to occur; the solution can be boiled for 5 minutes without damage, and is therefor preferable to cocaine solution; it is also cheaper than cocaine.

3. Alypin does not cause contraction of the mucous membranes. It is somewhat more irritating than cocaine when first applied.

4. Alypin solution, made in 1:4000 watery solution of thymol, is fully as stable as a corresponding solution of cocaine.

YANKAUER.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, November 12, 1907.

J. HOLINGER, M.D., President.

Tumor of Neck. By FISK, M. D.

Dr. Fisk reported the case of a man who complained of severe pain in the throat and inability to open the jaws, with hoarseness. There was a hard swelling under the angle of the jaw on the left side. The mass was incised, but no pus was found. When the patient was referred to the ear clinic, pus was discharging from the ear, and he could open his jaws about one fourth of an inch. There was a small, soft spongy body in the external canal, covered with skin, and a probe could be passed through the opening in the swelling down into the neck. Pus could be forced out through the ear on pressure. The soft palate in the region of the left faucial tonsil showed evidences of a peritonsillar abscess. The question was whether this was a peritonsillar abscess which had ruptured into the neck and then discharged through the external ear, or an abscess in the parotid region. No examination of the pus was made.

DISCUSSION.

DR. NORVAL H. PIERCE: I think that the microscope will clear up the diagnosis. Tuberculosis and syphilis can be excluded, although it is possible that tonsillar disease has been running and this is an exacerbation of a chronic condition, but I am inclined to think that it is actinomycosis, although the course is rather rapid.

DR. J. HOLINGER: The case looks like one of angina Ludovici which started as a peritonsillar abscess and ruptured into the neck.

Healed Primary Nasal Tuberculosis. By JOS. BECK, D. M.

To be published in full in a subsequent issue of THE LARYNGOSCOPE..

DR. W. L. BALLENGER: This patient came under my observation 13 years ago and remained under my care for six years. Previous to the time I saw her, she was under the observation of Dr. Max Throner for four years. She has a brother with the identical lesion in the nose. She was very well, unusually so, and no evidence of tuberculosis of the lungs could be found by Dr. R. H. Babcock and others, so that it undoubtedly was a case of primary nasal tuberculosis. A curious feature of the case was that the patient would cure herself, that is, get well without treatment at certain times of the year, leaving a smooth scar in the nose. In the winter the trouble would recur, so that in all probability the lady is now passing through one of her favorable periods, and I believe that a year hence Dr. Beck will again report her as cured. He has done it before, and doubtless will do it again.

The membrane in the nose is not healthy now. It is swollen and edematous, especially on the septum at the point of perforation. I believe that the disease will again recur, but it has made considerable progress since I saw the patient last, when she had no lesion, except on the left side of the septum, whereas now the anterior portion of the middle turbinate has been diseased and removed. The case certainly is an interesting one because of the automatic cure during the warm months.

DR. C. M. ROBERTSON: How much mercury and how much potassium iodide has the patient had?

DR. BECK: I have given her inunctions for eleven weeks followed by potassium iodide, as high as 340 drops a day.

DR. BALLENGER: I want to say that Dr. Thorner made the same diagnosis as Dr. Beck and I did.

DR. MAX REICHMAN: I would suggest that Dr. Beck try the Roentgen ray. The nasal cavities can be reached directly by the rays and tubercle bacilli are very apt to undergo certain changes under the influence of the rays. I think that a trial would well be worth while.

DR. J. HOLINGER: The case I showed four years ago ran the same course as Dr. Beck's case. Cases of tuberculosis of the nose are most tedious, and always have a tendency to recur. One point that struck me in this case is the extreme scar retraction in the left nostril, a common appearance in the later stages of the disease. The wings of the nose are drawn up and shriveled, and the entrance to the nose is smaller than normal.

DR. BECK: I gave the history of this case as I received it. The patient has been suffering for 20 years, although she has consulted physicians for only 15 years. As long as she was under treatment there was always a crust or scale present. She is free from that scale now. There has always been a red, elevated membrane with small, pin-point granulations. I believe that the patient is well now, although I am not certain of that. I will report further on the case later. In regard to the Roentgen ray, she has had eight weeks of treatment and also with radium and high frequency current.

Radiography in the Nose, Throat and Ear. By J. C. Beck, M. D.

Dr. Jos. C. Beck exhibited plates to show the value of the Roentgen ray in the diagnosis of diseases of the nose, throat and ear and as an aid in the treatment, and demonstrated the methods employed in making these radiographs.

DISCUSSION.

Dr. W. L. Ballenger: Dr. Reichmann has taken more than fifty plates for me during the past year, and I have had plates made by other radiographers. I have two plates showing an absence of the frontal sinuses, and some other interesting and curious conditions. In three cases, the anterior ethmoidal cells were found absent over the orbit. After removing the ethmoidal labyrinth, I could pass a probe across the orbit, two-fifths of the way across. So that removal of the ethmoidal labrynth is not complete. Sometimes the cells extend beyond the reach of surgical instruments. I have a case under observation now in which the posterior ethmoidal cells pass along the side of the sphenoid for 1½ inch, and I saw another specimen where the cells passed not only along the side of the sphenoid but behind it. In such cases we must resort to prolonged treatment to establish drainage from the remote cells.

Another case of bilateral frontal sinusitis was interesting. I found the mucous membrane on one side entirely gone. The X-ray plate showed on that side no such great density as on the opposite side. Dr. Coakley said that he was not sure what made the cloudiness; whether infiltration of the mucous membrane, pus or denuded bone.

The plates Dr. Beck shows are very beautiful and instructive and of great value in diagnosis; but it is not impossible to make a diagnosis without the X-ray, but we can make it more absolutely with the plate. The plate also shows the area of the field of operation, and it gives us an opportunity to plan the operation to better advantage and shows how much deformity we may expect to follow and what operation must be chosen. I have had only one case in which I did the Killian operation and in which there was marked deformity. The cells were deep and large.

The angle at which the rays are directed through the skull is of importance, and I am not sure that my plates have been taken at the correct angle.

Dr. R. H. Good: I have used this method in cases of mastoiditis and antral empyema and found it to corroborate the clinical findings. In one case of mastoiditis, I took a picture at one angle and then at another, and by comparing the two plates I got positive evidence of the disease. By placing the plate horizontally it makes a good picture of the antrum better than of the frontal sinus. I have taken some pictures below the occiput and it makes a good picture of the antra but a poor one of the frontal sinuses. I believe that these X-ray pictures ought to be taken in every case. I have yet to see a case where the sinuses are filled with pus that does not show a shadow.

DR. NORVAL H. PIERCE: These two plates will demonstrate that the rays must pass at a certain angle to show the frontal sinuses. (Exhibited two X-ray plates.)

DR. MAX REICHMANN: I wish to congratulate Dr. Beck on the results he has obtained. Albers-Schoenberg showed that the frontal sinuses must be taken in the manner described by Dr. Beck, and all plates I have taken were taken in that manner, by directing the main or axial ray through the occiput. I took the first pictures with the patient in the horizontal position, but the remainder were taken with the patient lying on an incline. It is essential to use the compression apparatus because the patient can not lie perfectly quiet for two minutes. Even the breathing will move the head. I have endeavored lately to make the sinus pictures in stereoscopic views. The literature on the subject is very meager; in fact only two papers have been published. and one of these was by Wassermann.

As far as the sphenoid and ethmoid sinuses are concerned, all workers agree that it is impossible to make the diagnosis except when the tube is turned in such a way that only one sinus is taken at a time. This is possible by making an oblique exposure, but, unfortunately, we get disfigurement and the pictures are not good for diagnosis. The lateral view must show the mastoid cells, the auricle and the antrum Highmori. Another good method, although difficult for the patient to bear, is to introduce sounds into the cavities which are to be skiagraphed. I have had a few cases of suppuration of the frontal sinuses where the probe was introduced and it showed the conditions beautifully.

DR. G. P. MARQUIS: Dr. Beck is to be congratulated on his work, but I agree with Dr. Ballenger that in the great majority of cases we can make the diagnosis by simpler methods. I saw Killian do seven operations and at no time did he use the radiograph for diagnosis. The X-ray plate was used not so much from a diagnostic standpoint as an aid in the operation. For this purpose the radiograph is an excellent thing.

Dr. Geo. E. Shambaugh: I wish to emphasize that we do not make a positive diagnosis of accessory sinus disease from X-ray plates alone. This diagnosis must finally depend in most cases upon careful intranasal examination. With such an examination the use of X-ray plates as an aid in diagnosis can in most instances be dispensed with. The great benefit of X-ray plates is that they give us an accurate idea in many instances of the exact outlines of the sinuses. This is especially true in case of the frontal sinus.

Dr. S. Friedberg: Dr. Reichmann spoke of putting a probe into the sinus to be X-rayed. I find that a method of considerable value especially in suitable cases.

Dr. Ballenger: Because we find evidence of disease in the frontal sinuses is not an indication for doing a radical operation. I have treated such cases intranasally with much satisfaction.

Dr. Beck: I do not make my diagnosis by radiographic plates, but I think it is an aid in diagnosis and we ought to use it, and one reason why we do not make greater use of the method is because it has been unsatisfactory. You need not fear any ill results from this work. Anatomically it certainly is of great value to prove the existence of the sinuses. Dr. Good's statement does not conform to accepted methods of making radiographs. I would like to see his plates because it has been my experience that plates are no good when taken at an angle. I have looked over the literature on the subject. Albers-Schoenberg makes no particular mention of the line of the ray. Goodman, Killian's radiographer, discovered this particular point by accident. Stereoscopic views are beautiful and I am working on that now. We can demonstrate the depth of the sinuses and without any side views, except to tell the depth of the posterior frontal diameter. As for the use of sounds to demonstrate the mastoid, I have reserved that part for another paper. I find that sounds are not of much value in diagnosis.

A Case of Labyrinthine Deafness with Tone Island. By Geo. F. Shambaugh, M. D.

To be published in full in a subsequent issue of The Laryngoscope..

DISCUSSION.

Dr. Norval H. Pierce: It has been largely dwelt on that the so-called Bezold triad is essential to the diagnosis of otosclerosis, and in a recent paper, I tried to bring out the point that in otosclerosis we have two factors working against each other as it affects the reaction of tuning forks. In one the bone conduction is increased and the low tone elevated and this is due to a spongification and ankylosis about the foot plate of the stapes. But that is not always the case. Spongification of the labyrinthian capsule may take place at any part, and if there is no spongification and ankylosis of the stapes, we do not have lowering of the tone limit nor prolongation of bone conduction or negative Rinné, but have the same reaction as in nerve deafness; namely, decrease of bone conduction and a positive or shortened Rinné. So that these cases can be grouped under the head of otosclerosis in the absence of other diseases to account for the condition present.

DR. J. HOLINGER: The case as described here is given in the textbook of otology by Bezold. Siebenmann wrote those chapters and gives almost the same experience with the only difference that the patients were women and not men, two sisters, who were treated for "hard hearing." One shows distinctly the symptoms of otosclerosis and the other of nerve deafness. This disease often affects sisters or brothers; then jumps a few generations and appears again. The principal muddle was caused when the word otosclerosis was coined. Siebenmann wanted to call it spongification, but the word otosclerosis was forced on him because it was in use before we knew the pathology of the disease. If the word spongification had been retained, then the location of the process would have been excluded, and then we would have had only this form; the spongifying outside of the oval window, and the other form, spongifying at the foot plate of the stirrup. But, no doubt, this is pathologically the same process and the location is a different one.

Bacteriology of a Case of Stomatitis in the Course of la Grippe.

MM. MONTFORT and FOSTINEAU. *Gaz. med. de Nantes.* Sept., 15, 1906.

Two days after the commencement of an attack of grippe in a child of 14 years, the velum palati, the uvula, the gums and the mouth were swollen and covered with a phlyctenular eruption accompanied by fever and repeated chills. The buccal mucosa was gently rubbed with a tampon of cotton and the bacteriological examination showed large numbers of thin, short bacilli, presenting all the characteristics of the microbe regarded by Teissier as the specific agent of la grippe. SCHEPPEGRELL.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

Twenty-ninth Annual Congress. Washington, D.C., May 7 to 9, 1907.

A. W. DeRoaldes, M. D., President.

Tuberculosis of the Accessory Sinuses of the Nose. By J. W. Gleitsmann, M. D., New York.

(Published in full in The Larynoscope, p. 445, June, 1907.)

DISCUSSION.

Dr. C. C. Coakley: The case referred to by Dr. Geitsmann was one that was accidentally discovered in the pathological examination of the tissue removed from the antrum. Both antra were completely filled with thickened, edematous membrane, not different from that often found. There was no gross pathological change that could be determined. It was only on microscopic examination that the mucous membrane of one side was found diseased. Giant cells with tubercle bacilli in them were found, thus making the diagnosis of tuberculosis positive. The tissue came from all the accessory sinuses at practically all of the operations. This is the only case of tubercular infection that I have found in the mucous membrane taken from the deceased cavities. The case came to the out-patient department of our clinic and was under observation for nearly two years and a half, or three years after the operation; and the last time I saw the patient was a little over a year ago. At that time he had no evidence of tuberculosis in any other portion of the body.

Prof. Gustave Killian: During the last few years I have had a case of multiple tuberculosis of the bones with caries in the left frontal sinus. I opened an abscess and found the bone carious. I then had to do a frontal-sinus operation and also to remove a good part from the frontal bone and the temporal region. The tuberculous process had rendered the bone yellow. Only part of the bone being diseased, it was easy to see a clear division between the diseased and the normal part. I performed a thorough operation, and the wound healed by first intention. A few weeks afterward, however, the patient had a recurrence; and the case has progressed as we are accustomed to see tuberculosis of other parts of the body do. I think that the lungs are about destroyed. It is very difficult to remove all the diseased part of the bone in this region and have a good recovery. There was tuberculosis of the maxillary bone and of parts of the walls of the antrum, but no pus. I have examined the mucous membrane of the frontal sinus microscopically and have found tubercles in it.

Dr. H. P. Mosher: The kind of tuberculosis described in the paper is a high-grade tuberculosis. There is, however, another form, a low grade of tuberculosis. It is a low grade of scleritis, which has defied treatment and diagnosis as to the cause. During the last six months it has been proved to be a low form of tuberculosis. The diagnosis was made by injections of tuberculin, and the treatment is carried on in the same way. Since the publication of this work I have been closely watching cases of sinus-disease, giving tuberculin in the hope of getting a reaction. The patients to whom I have given tuberculin, however, did not show any reaction. One of my colleagues was more fortunate. A typical case of empyema with pus in the cavities of the eye gave a reaction to tuberculin. It seems possible that a low grade of tuberculosis may be found to be the cause of the suppuration in the accessory sinuses.

Dr. Coakley spoke of not finding the bacilli. As a rule, one will not find the bacilli in these low forms. It would be rather uncommon to do so. I think it will be an extremely valuable fact to have, if the tuberculin is to settle the diagnosis or if it is to be a chief part of the treatment.

Dr. H. L. Swain: Is there any local reaction?

Dr. Mosher: No.

Dr. Swain: Would you use the tuberculin if there were advanced pulmonary tuberculosis?

Dr. Mosher: Tuberculin does very little good. I should not expect to get any results. I should use plain surgery.

Dr. Gleitsmann, closing: I am very happy, indeed, to hear from Dr. Coakley. I did not know that his case was still living a year ago. I hope the patient is alive now and that he may live a long time; because he is, very likely, about the only surviving case of sinus-tuberculosis. On the other hand, I am extremely grateful that the last very interesting case of Prof. Killian has not been published yet; for in that case I could not have embodied it in my paper.

Dr. J. Solis Cohen: That makes the discussion the more interesting.

Dr. Geitsmann: The subject touched upon by Dr. Mosher, I did not expect to come before the society in connection with my paper. I do not know whether he referred to some investigations made abroad by Dr. Bartles, recently published in the Zeitschrift f. Grenzegeb. He spoke of some investigations made in which they tried to find out what constitutes what was known some years ago as the tubercular state. Bartles had advanced the theory that before the appearance of tubercle bacilli there exists a pretuberculous stage, which manifests itself in lymphoid infiltration of the surrounding parts. It is the lymphoid stage of tuberculosis, but no actual tuberculosis exists. His opinion is that it is a stage that is brought on by hydremia of the parts involving the lymphoid tissue, similar to the hydremia observed in septic cases before the real septic symptoms manifest themselves, and in which the lymphatic system appears to be hydremic and slightly infiltrated before the septic condition really arrives.

I probably misunderstood Dr. Mosher to say that tuberculin has no effect in pulmonary tuberculosis.

Dr. Mosher: It has very little. When you have active bacilli you get little result.

Dr. Gleitsmann, concluding his closing remarks: I did not bring up this subject. The main use of tuberculin and its derivatives is to destroy the bacilli. They will not do any good in mixed infections. They will not reduce or affect favorably cheesy tissue. They only affect the bacillus. Dr. Mosher will find a number of publications in which tuberculin and its derivatives, among which I include all the preparations based on the production of tuberculin, have relieved the tuberculous process in a large percentage of cases of primary tuberculosis in which mixed infection did not exist.

Massage of the Pharynx; Exhibition of an Instrument used for the Purpose by a Famous Actor. By S. W. Langmaid, M.D., Boston.

DISCUSSION.

Dr. J. Solis Cohen: I have heard with great interest the paper, and have seen with interest the instrument. In the early days of laryngoscopy many of us had to use an instrument something like this to teach the patient to stand handling of the epiglottis. I used what the dentists call the extension finger in order to accustom the patients to this, so that I might more readily make my applications. I attributed the improvement to the facility of the patients, and not to the instrument.

It would be interesting to have Dr. Langmaid tell us, in closing, how he uses his instrument for therapeutic purposes.

Dr. G. Hudson Makuen: Personally, I have always been under the impression that it is not so much the massage of the pharynx and the throat that renders the patient tolerant to instrumentation as it is the knowledge gained by the patient in attempting to massage or manipulate the throat with the toothbrush handle or some such instrument. If you can get the patient in possession of the right idea when his throat is being examined you will have very little trouble; but the patient's attitude is generally one of self-protection, rather than of co-operation. He is trying to keep from being hurt or from gagging and he is not giving you intelligent assistance. If you can teach him to control his organs voluntarily, so that when you say "Relax the soft palate," he will drop it down you will have no trouble in examining the pharynx or the larynx. I have recently had the pleasure of examining the throat of a noted actress. She paid no attention to what I was doing, but turned her eyes up to the ceiling. I would say, "Relax the throat," and she did it at once. This was not due to the fact that she had massaged her pharynx, but because she had the right idea of helping. My experience does not coincide with that of Dr. Langmaid, that singers and speakers have anemic pharynges. Some of them that have used the voice as Forrest did have hyperemic pharynges, and irritable ones.

Dr. Clarence C. Rice: I have found, as has Dr. Langmaid, that the throats of singers and actors are, as a rule, anemic, except when they have colds. Dr. Makuen has just taken the opposite view. My experience tallies with that of Dr. Langmaid, that either from intelligent treatment or from a lack of constitutional catarrh, noted singers and actors do not, as a rule, have much chronic pathological conditions. This winter I have seen three or four remarkable cases in persons that sing very well, who have had a tremendous amount of pathological condition. I have seen a tenor who had the entire postnasal space filled with adenoid tissue, and the lateral folds almost filling the upper pharynx. This has been a very serious drawback to him singing during the season. I have known noted sopranos with a long uvula and greatly congested tonsils, who, yet, have persisted in singing and are very unwilling to undergo any sort of semi-operative treatment to remove these large pathological conditions, which would give them great relief. It seems to me that it depends a good deal upon what part of the country they come from. Two of these persons are Italians. In Italy singers have not had the amount of treatment that the French singers have had; so they are loathe to undergo treatment. My feeling has been that the strong use of the voice and the vibratory massage of the pharynx tend rather to atrophy and anemia than to congestion. I should suspect, if I found congestion in a singer's pharynx without the presence of any special nasal or postnasal catarrh, that it had been caused by alcohol or tobacco, rather than by the use of the voice. Massage, intelligently employed, seems to me a useful therapeutic measure.

DR. MAKUEN: I may have been misunderstood in what I said. I meant that following the faulty use of the voice we have the hyperemic and congested condition.

DR. LANGMAID, closing: I purposely did not mention anemia in my description of the throat; I said a lack of hyperemia. Dr. Makuen has now said that though he does not agree with me in other cases, in those in which there has been a wrong use of the voice he thinks that this swelling or hyperemia may occur. Dr. Rice has noticed in those observed by him that they had been nearly all winter in this condition. That is not the healthy condition which results from the proper use of the voice long continued. Certainly it has been an observation of mine, and it seems philosophical, that the singer or actor who has had a successful career must have a throat free from hyperemia. Unfortunately, as Dr. Rice has implied, the hyperemia, the length of the uvula, and various pathological conditions may be owing to the abuse of food or alcohol; and we will include smoking.

When he spoke of Italians, I agreed with him; for it is among these people that I have found the state he describes.

Dr. Makuen very properly and justly has spoken of the education of the throat in another way. I quite agree with him. I have no doubt that all of us have become more experienced than we were in the early years; but a little spurt of cocaine, and we are all right so far as getting a view of the patient's throat is concerned.

I wish to emphasize the value of instrumental massage of the throat. It is in accordance with the observations in external massage. The vessels are reduced to a proper size by the flowing away of the excessive blood; and after this there is a tonic contraction of the tissues. It is only lately that I have thought that it would be of service to prescribe it.

Removal of Papillomata of the Larynx by Direct Instrumentation with the Aid of Killian's Tubes. By CORNELIUS G. COAKLEY, M. D., New York.

DISCUSSION.

PROF. G. KILLIAN: I congratulate my friend Dr. Coakley upon his direct results in cases of papillomata of the larynx. At present, I have in my clinic two cases in which I have removed papillomata by the direct method. I introduced a tube between the epiglottis and the trachea. This gives a very good view of the interior of the larynx. You can then put in the instruments and take out whatever is necessary. The other method is to introduce a tube into the larynx. If this is done with the patient's head hanging over the edge of a table, the tube is very easily removed from the larynx and there is more ease in removing diseased parts; but it is necessary to cocainize the larynx very thoroughly. Otherwise it will contract so that nothing can be seen. If the cocainization has been thoroughly done, the patient breathes evenly, the vocal chords are open, and one can get a good view. This instrument is new.

It is a good thing that in cases in little children one can, by this method, remove papillomata of the larynx without performing laryngotomy. It was formerly necessary to perform laryngotomy quite frequently; because in this disease the recurrences are very common. In the literature of the subject for the last nine years there are ten cases requiring laryngotomy to one that could be done without it. In every case we can take the papillomata out by the direct method; and I hope that we can also avoid the many cases of tracheotomy formerly necessary if the patient comes to us before the disease has reached the condition that tracheotomy must be resorted to. If he can breathe sufficiently well to permit of general narcosis, the direct method of operating may be employed.

With this method, however, it is not possible to cure all the cases, the disease sometimes recurring as formerly. In such instances I would recommend doses of arsenic given over a long period. This drug is known to have the power of affecting favorably epitholiomata and papillomata, and I have had good results from its use. It was advocated ten years ago by Dundas Grant, but forgotten.

I also recommend iodid of potassium, which has been used for a long time with good results. Papillomata that before its use had tended to recurrence did not recur. In another instance, the larynx was healed; this child has a very nice voice and can sing.

I wish to complete one case of Dr. Coakley's. I think it is the fourth. This patient, a girl, came to me with a letter from him, in which he stated that the larynx contained papillomata; but when I examined the child I found that these had disappeared. There are cases in which papillomata disappear spontaneously. I have seen another case over a period of fifteen years. Another child came to me with her larynx filled with papillomata, but the mother would not allow them to be removed. She left the place, but returned two or three years afterward. Nothing had been done, yet all the papillomata had disappeared.

Discussion of Dr. Coakley's Paper to be Concluded.
Proceedings of the American Laryngological Association to be Continued.

Chronic Ossifying Labyrinthitis. G. ALEXANDER. *Monatsschrift fur Ohrenheilkunde.* Aug. 1906.

The patient was a blind deaf-mute, 71 years of age, who died of general arteriosclerosis.

Microscopical examination of the internal ear showed the following changes:

1. Marked atrophy of all the branches of the auditory nerve and of its ganglia.
2. Total degeneration of all the nerve endings in the labyrinth.
3. Closure of the helicrotrema.
4. Partial bony occlusion of the beginning of the scala Vestibule.
5. Bridges of connective tissue stretching across the beginning of the scala tympani, and in the niche of the round window.
6. Atrophy of the stria vascularis; blood clots in both scalae.

On the left side these changes were more marked than on the right, and there was in addition considerable ossification of the structures of the labyrinth. The auditory nerve on both sides was reduced to a thread-like strand, but this atrophy became less marked towards the brain, so that at its entrance into the brain the nerve was of normal size; the cerebral centers were also normal.

YANKAUER.

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

PERSISTENTLY RECURRING PAPILLOMATA OF THE NASAL CHAMBERS WITH SOME REMARKS ON THE DIFFERENTIAL DIAGNOSIS OF EPITHELIAL PROLIFERATION.

BY JONATHAN WRIGHT, M.D.; NEW YORK CITY.

A number of years ago there was an active discussion as to the frequency of the occurrence of papilloma within the nasal cavities. Hopman and a rather numerous following declared that they are of common occurrence, while others asserted that a nasal papilloma was a rarity. In the course of the discussion it soon became apparent that the difference of opinion was merely a question of terminology. Virchow, at the rise of modern pathological histology, in giving the technical name of fibroma papillare to papilloma furnished some excuse to Hopmann in his inclusion of papillary or "mulberry" hypertrophies under the generic term of "papilloma." The excessive deepening of furrows in a "mulberry" hypertrophy frequently produces exaggeration of the "berry" into a long straight or bulbous papilla. These exaggerated local creases in turbinate hyperthrophy, to the naked eye are frequently indistinguishable from a true papilloma. Were it not for the microscope the difference in the histogenesis would be difficult to trace. At once, with the low power magnification, it is seen that the papilloma, such as we so frequently find it at the edge of the soft palate and within the laryngeal cavity, is an epithelial proliferation. Strictly conformable to Virchow's general scheme of nomenclature, it should be called an epithelioma. The slender stems of fibrous connective tissue, over which layer after layer of epithelial cells are coated, gives little excuse for calling it a "fibroma," but the objection to the term "epithelioma" in modern nomenclature is obvious.

The papillary hypertrophy, on the other hand, is chiefly fibrous connective tissue greatly overgrown in the form of digitations, and these latter are covered by two or three layers of epithelium—not markedly more than is seen in ordinary smooth hypertrophies.

I have thus briefly reviewed the differentiation made ten or fifteen years ago in these growth, in order to emphasize the rarity of the benign nasal "epitheliomata," the true papilloma of the nose. In any form they are exceedingly rare. I doubt if more than twenty cases thus differentiated from papillary hypertrophies can be found in rhinological literature. I have myself seen less than half that number, though a much larger number of specimens have been referred to me with that clinical diagnosis, which subsequently proved to be a fibrous hyperplasis rather than an epithelial hyperplasia.

Laryngologists are familiar with cases of laryngeal papilloma, both in children and in adults, in which the extent of the proliferation and the rapidity of recurrence after removal is very great, so that it is difficult—in children, usually impossible—to avoid a tracheotomy. We are familiar with all degrees of this activity of growth in the larynx, from the little pinhead papilloma of the elderly man, which gives rise to such anxiety but which when once pinched off never recurs, to the profusely vegetating masses which recur as fast as they can be removed, sometimes even persisting, after the most thorough eradication by means of a thyrotomy.

In my experience, after I have by repeated histological examinations satisfied myself of the benign nature of the epithelial proliferation, they never change their type to that of malignancy. In laryngology there is no such wide-spread, harmful error as the belief in the frequency of this metamorphosis from operative interference. In view of much sentiment to the contrary, I cannot too emphatically state my belief—founded on considerable experience with the histological diagnoses of these growths—that such metamorphoses must be exceedingly rare. I have never seen any satisfactory evidence of it. Where this belief has been suggested from clinical experience, there was malignancy to begin with; the first clinical or microscopical diagnosis was at fault, the first grasp of the forceps, removing tissue for the microscopic diagnosis, failed to reach the histological evidences of malignancy. It unmasks a deeper infiltration and by the hyperaemia of the trauma protrudes the heterogeneous cells into prominence. However unfortunate an interpretation may be put on this sequence of events by the patient or the family doctor, it is in reality a fortunate circumstance in the true interest of the patient if the laryngologist is watchful and cautious in the expression of his opinion. It helps the diagnosis and arouses suspicion. Instead of endangering the patient's life it helps to give a timely warning. A slow, quiescent, subepithelial proliferation unobtrusively but slowly creeps beyond the possibility of surgical eradication, if only "observed" long enough. It indeed soon becomes a "nolli me tangere."

In such a case, or in a subglottic case beyond the reach of forceps and of accurate vision,* the growth often goes on to a stage when a radical operation is out of the question. Too often the fear of touching a perfectly accessible laryngeal growth leads to the same result, and this result is in laryngological practice more frequent because of the belief of the majority of laryngologists in this old fallacy,—that is, in the power of a nip of cold steel to turn a benign heaping up of the epithelium into the marvelous potentialities of a malignant growth. Semon's statistics of 10,000 cases seem to have been collected in vain.

In the more frequent laryngeal papillomata, in nasal papillomata, as in those here reported, persistent instrumentation of all kinds, persistent recurrences in many scores of cases, have never resulted in a change of histological type so far as my experience goes.

I have not gone much out of my way in thus exposing myself to criticism, because in the history of the three cases to which I wish to refer I want to bring into sharp contrast the harmless persistency of a recurrence in a "benign epithelioma," and the disastrous persistency of recurrence in a malignant epithelioma. In the nasal chambers proper the latter growth is about as frequent as the former, both being rare. As in the larynx, in the cases of nasal papilloma with whose clinical history I have been familiar, there is the same variation in the liability to and the persistency of recurrence.

I have myself seen two cases, I know of the report of another in literature in which the benign but persistent recurrence has extended over many years without a change of type. In the larynx after the tracheotomy tube is in, the growth usually may be left to itself without danger to the patient's life, but in the nose this histologically benign growth may extend and block up the accessory sinuses and upper channels of the nose in such a way and to such an extent that grave fears of meningeal infection from nasal suppuration may arise. In this aspect of the cases they may endanger life.

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*The cases that have given me the most distress and have given rise to the most lively chagrin, have been those malignant tumors of the laryngeal ventricle which, covered by the healthy fold of the false cord, present a smooth surface from which nothing can be clipped, and on which nothing suspicious can be observed.

Case I.—I have first to refer to the history of a case of a woman, aet. 42, reported in 1886 by Verneuil.* Papillomatous masses were extruded from the nostril and the nasal arch was widened into the frog face familiar in malignant growths and naso-pharyngeal fibromata. They were cleaned out repeatedly by intra-nasal procedure, and promptly recurred. An external incision opened up the nasal cavity and the mucous membrane was thoroughly curetted, and much of the turbinate structure was removed. This involved the resection of the anterior wall of the maxillary sinus. There were multiple recurrences and multiple operations. Finally there only remained the palatine arch and the posterior two-thirds of the floor of the orbit. The proposition was made to leave the cavity open for continued curettements. Naturally, it is not surprising that after several years of this treatment the case passes out of observation in practically the same condition as when first seen.

With the memory of the report of the atrocious treatment and the results in this case, it is not surprising that I counselled more expectant treatment in the following cases:

In February, 1904, Dr. Arnold Knapp gave me some sections of a growth from the nose of a patient whom he subsequently sent to me for advice. He had correctly diagnosed the affection, but others who had seen it regarded it as malignant or syphilitic.

Case II.—Woman, aet. 45. Married; robust health. No syphilitic history. It was elicited from the patient that ten years previously she had a very severe blow from a fall on a bicycle handle, the violence being inflicted on the nose at exactly the external spot corresponding to the situation within from which the growth seemed to spring and radiate.† Five years after this accident the growths were first noted, but as they were by that time so abundant as to project from the nostril, it is fair to conclude that their real beginning had long antedated this observation on the part of the patient. There had been little or no pain or bleeding and no enlarged glands. There was an occasional history of coryza with sore throat, and a feeling of pressure over the maxillary and ethmoid sinuses.

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* Verneuil: Bull. et Mem. de la Societe de Chirugie de Paris, No. 12, p. 659, 1886.

†In the report of a case of sarcoma in an ox, I have drawn attention to the coincidence—perhaps it is nothing more—of the infliction of external violence and the occurrence of an intro-nasal tumor. See Medical Record, April 20, 1895.

On examination sessile papillary growths, looking like a widespread "seed wart," covered the upper and anterior surface of the right nasal chamber, extending over the middle turbinate and the adjacent septal surface; going far back in the middle fossa, running forward to the muco-cutaneous junction of the vestibule of the nose, extending down somewhat over the inferior turbinate. Some masses were of the size of a bean, but for the most part they were smaller and more sessile. There was no evidence of sinus involvement, but the exact limitations of the growth could not be clearly defined. To me it furnished no suggestion of malignancy or syphilis. I advised against any external operation and Dr. Knapp, some months after I saw her first, placed her under ether and curetted all attainable surfaces by intranasal procedure. In a few weeks the condition was practically the same as before the operation. When placed by Dr. Knapp under my care, Dr. Harmon Smith and I at many sittings at short intervals removed large masses. For two years this was kept up with no perceptible change in the promptness with which recurrence took place. She then moved to Providence and was placed in the care of Dr. Edward S. Bacon, who continued the removal of the growths, and for a time sent them to me for examination. There supervened some evidence of sinus suppuration, but the symptoms were not sufficient to warrant operation. She subsequently came under the care of a Boston specialist, and I learn from Dr. Bacon that the conditions have improved somewhat.

As to the histological features, there was nothing differing in any way from that of a typical papilloma of the larynx except in the profusion of the epithelial proliferation. The stems of the connective tissue frame-work were few and far between. Through one fragment the sections fell in such a way as to exhibit the spot where the normal columnar epithelium of the middle turbinate region quickly changed into the profuse proliferation of the benign papilloma, but there was absolutely nothing to be noted except that the nonciliated columnar cell grew shorter and broader, and one cell was piled on the other in many layers at the surface, becoming a little granular and in places approaching the squamous type. The stroma at this border line showed some thick walled blood vessels and evidences of chronic inflammation, as well as of more recent acute involvement. From this was derived the few connective tissue fibres and capillary blood-vessels which shot up into the proliferating epithelium and formed the papillae. Over all this time, a period of at least five years, the growth was persistent with little real harm, but a good deal of annoyance to the patient, and attended by a good deal of anxiety on the part of her surgical advisers, lest the supervention of sinus suppuration should lead to grave secondary dangers of pyogenic infection, which would be extremely awkward in such a patient.

Case III.—In March, 1905, a nasal growth of exactly the same histological character was submitted to me by Dr. A. J. Smith, of Yonkers, New York. I subsequently also saw the patient in consultation. To Dr. Smith and to Dr. J. F. McCaw of Watertown, New York, who also saw the patient, I am indebted for the clinical history.

Mrs. G. aet. 55, a farmer's wife. She had had intranasal obstruction for ten or twelve years, but the present trouble was supposed to have begun two and a half years before I saw her. The growth sprang from the inferior turbinate of the right side and choked up the lower part of the right nasal passage. It had been removed in part or whole upon five different occasions within two years. The growth was very friable and bled easily upon manipulation. While the patient was not strong, her health had undergone no material change. Rhinoscopic examination showed a much angrier growth but of somewhat less extent than in the former case. Dr. Smith removed it and as the field of operation was well in view more confidence was felt as to the thoroughness of the operation than in the former case. It promptly recurred, however, and continued to do so in spite of several subsequent operations by her family physician, which probably were not very complete. I learn from Dr. Smith that after a year of this treatment they finally ceased to recur, and for a year now she has been free of the intranasal growth. A diagnosis of malignancy had also been made in this case and the advisability of an external operation urged.

While this third case did not present the persistence of recurrence noted in the other two, it nevertheless gave considerable trouble and anxiety. It is chiefly interesting here as forming a graduation in the exuberance of growth exhibited between the ordinary papilloma and the case of Verneuil and that of Dr. Knapp.

In the nose there is another growth which also presents the features of enormous epithelial proliferation. It also grows in the form of papillary projections. I speak of the benign adenomata, called by Billroth *Zottenkrebs.* They seem, at least in the nose, to bear a closer relationship to the malignant adenomata or adenocarcinoma than the "benign epithelioma" or papilloma to malignant epithelioma. Neither clinically nor microscopically is the observer so apt to confound papilloma of the nose with epithelioma, as benign with malignant adenoma. In the latter cases I have frequently, in spite of all the humility engendered by years of experience, pronounced an adenomatous growth of the nose malignant, which has yielded permanently to superficial ablation. With these growths I know of no way, either from the clinical history or from the microscopical findings, nor, often, from the two combined and compared, to make a confident diagnosis. Growing from the glandular epithelium the adenoma is apt to simulate malignant infiltration more than the papilloma which is a proliferation of the surface epithelium, and however profuse and rapid in its recurrence the latter may be it does not present that evidence of infiltration which we recognize clinically in the malignant epithelioma. Nor is there the uncertainty in the histological differentiation. In adenoma the cells may proliferate in such a manner that much of the glandular structure is lost, and the epithelial cells depart considerably from the normal type, and yet ablation and curetting will eradicate the growth without excessive difficulty. Such was the case referred to by Dr. Hurd.*

On the other hand, I have seen such procedures, even accompanied by the most extensive resection of the parts, inadequate permanently to eradicate the growth, which gradually extending and infiltrating the tissues causes the death of the patient in two or three years.

Here structure is no safe criterion of malignancy, and the clinical course as well frequently leaves the observer in much doubt. In the adenomata, such as I was able to report † from Dr. Hinkel's practice, where in spite of persistence in recurrence and the extent of the growth, the structure never lost its markedly acinous character, the microscopic findings enable one to assert with some confidence the essential benignity of the neoplasm. After eleven years in Dr. Hinkel's case, and in others with which I am familiar after repeated recurrences, the tissues finally cease to reproduce the excrescences.

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* The Annals of Otology, Rhinology and Laryngology, June, 1907.
† The American Journal of the Medical Sciences, October, 1898.

On the other hand, it does not always follow, even when the epithelial proliferation has lost its distinctly glandular appearance, that the prognosis is hopeless. I have referred to Dr. Hurd's case. The case reported a number of years ago by Dr. Bryan* also occurs to me, in which also I was mistaken. I have never been able to accept the view that in those cases which eventually go the other way it is an instance of a benign turning into a malignant growth. Such cases finally show by their clinical course that they are malignant, but repeated examinations reveal no change in the character of the structure. Fully aware of the opposing views of many others in this matter, I am compelled to speak from my own experience alone. I have never seen in the nose and throat, where ablations of various growths are often made at repeated and long extended intervals, any evidence of a histological change in type from the benign to the malignant in either papillomatous or adenomatous growths, though I have frequently failed to find evidences of malignancy from superficial pieces of tissue from the larynx, which subsequent and deeper incisions revealed.

In the sarcomata, the connective tissue tumors, my experience of such apparent metamorphosis of structure is limited to one case, that reported by Dr. Hopkins. A tonsillar hypertrophy in a boy recurred, and I pronounced it as showing the usual structure of hypertrophy. A second occurrence after ablation I considered of a doubtful character. A third, and yet more a fourth recurrence, showed clearly the typical small round celled structure of the sarcoma usual in such a situation, and it ran the usual course. Now the lesson of this case was that the malignant potentiality was present in the first recurrence, but with normal stroma and germinal centres there was nothing, besides the prompt recurrence after the first removal, to support its malignancy.

Were I cognizant only of my own shortcomings in such cases I hope I should have the courage to ascribe it to a deficiency in my own personal equation, but I have shared in the humiliations as well as joined in the triumphs of others, for a sufficient number of years to induce me to believe that tissue structure is by no means an indication of the potentialities residing within the vital processes of its component cells. This I believe to be the proper light in which to view the number of instances reported by D'Arcy Power† and others of the benign course of malignant growths, if I may use an hibernianism. In the lower animals, at least the dog and the mouse,—to speak from my own observation as well as that of others—a structure which would be regarded as surely of malignant prognosis in man, not infrequently belies that interpretation in them.

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* Am. Journal of Medical Sciences, October, 1898.

†The Lancet, March 4, 1899.

Yet with a fuller appreciation of this fact than seems to be entertained by other pathologists, whose experience has not been somewhat tempered by clinical observation as well, I do not wish to be understood, for a minute, as intimating that the microscope is not in the vast majority of cases the safer criterion. Clinical experience and histological experience frequently fail as separate observations, but far superior to either one is the combination of both—yet this too is not unfailing. The essence of malignity lies far back of all that hitherto has been revealed in biology. It lies at the very root of life itself. It will never be revealed until science wrests from the unknown the secret spring of cellular mutations. It is intimately bound up with the broader problems of biological science—the question of species and varieties and their transmutations.

The tendency to epithelial proliferation is usually accompanied by a keratosis of the superficial epithelial layers. Though frequently local, it is often, as in the cases here reported, so persistent and yet so often devoid of any apparent local cause for the exaggerated cellular activity that it would be a very natural surmise to suppose that behind it lay some constitutional dyscrasia, at least as a predisposing factor in the etiology. This possible existence of a systemic cause for a local manifestation receives some support from the cases recently reported by Siebemann,* in which hyperkeratosis of the skin was accompanied by that of the mucous membranes. There is no doubt some genetic connection between papilloma and keratotic conditions of the epithelium, best seen in those curious cases of laryngeal pachydermia.

44 West Forty-ninth Street.

Radical Operation for Chronic Empyema of the Antrum of Highmore. K. BUCHER. *Monats. f. Ohrenh.* May, 1906.

The author applies the term "radical" operation to a thorough (?) curettage of the antrum through the enlarged socket of a molar tooth. The antrum is kept separated from the mouth during the treatment by means of a dental plate. He succeeded in curing 13 of 15 cases YANKAUER.

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* Archiv. fuer Laryngologie. Band xx. hft. 1, 1907.

GENERAL LYMPHO-SARCOMA ACCENTUATED IN THE PHARYNX.*

BY FRANCIS PATTEN EMERSON, M.D., BOSTON, MASS.

The following is the report of a case of lympho-sarcoma observed over a period of five years, including the histological and pathological findings, with a brief synopsis of cases found in the literature relating to sarcoma appearing in the naso-pharynx.

No attempt has been made to discuss malignant growths in general or their relation to pernicious anaemia and leukaemia, although as Kelling and others have pointed out, there is a close resemblance, both biologically and from a pathologico-anatomic point of view. This is shown by the favorable influence of arsenic, the Roentgen rays and intercurrent attacks of erysipelas upon all of these pathological conditions. Kelling cites the case of a large dog inoculated with heterogeneous embryonal cells, who died of pernicious anaemia. All cases treated by arsenic, however, were examined to see if there was any justification of the conclusions drawn in the case cited below, as well as the generally accepted value of this remedy placed upon it by the profession at large in malignant diseases. The results in some cases, as Tilley observes, seem truly extraordinary. On the other hand, such careful observations as those of Stoerk, Eisenmengen, Israel and Bosworth show that quite as remarkable recoveries occur without the use of this agent. The concensus of opinion, however, would seem to be that in the early stages, without glandular involvement, it is a remedy of approved value, but where recurrences take place, it is of but little use.

In regard to a provisional diagnosis of syphilis, Stoerk remarks that in his experience the diagnosis of lympho-sarcomas of the larynx and pharynx has never been made during life by laryngosocopy and rhinoscopy. For years, he and others with him have observed these tumors, but have diagnosticated syphilis in the recent and carcinoma in the older cases. Only microscopic examination of extirpated portions can reveal the pathology.

April 30, 1901, Mr. W., a merchant 47 years of age, born in Boston, was referred by Dr. P. with the following history:

His father died at 75 years of age of cardiac disease; his mother died at 74 years of age of carcinoma; one brother died of phthisis, one sister of scarlet fever. The patient has had typhoid and at the age of eight, an attack of rheumatic fever, which recurred annually 6 or 8 times. In 1898, an intestinal hemorrhage was followed by fainting; there was epigastric tenderness and a general consultant diagnosed duodenal ulcer. In 1899, the fainting preceded hematemesis. Following his hemorrhages, there first developed some difficulty in articulation which grew worse and was followed by hoarseness.

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*Presented as a Candidate's Thesis at the Thirteenth Annual Meeting of the American Laryngological, Rhinological and Otological Society, New York City, May 30, 31, and June 1, 1907.

The general examination showed a spare man, poorly nourished, with marked pallor and swollen upper lids, having the general appearance of pernicious anaemia. There were no scars on the skin or mucous membranes. Glands were found in the groin and neck. The spleen and mesenteric glands were not palpable. There was cardiac hypertrophy with a systolic murmur at the base; the rhythm, however, was regular and compensation good. There was slight dyspnoea. The uvula was club-shaped and the size of one's thumb. A new growth, which seemed to be an extension of the posterior palatine folds was seen in the lateral walls of the pharynx as large as the little finger with a central plaque between; this central mass protruded at the lower third of the pharynx; it was resistent to the finger and of a grayish color. The larynx was not involved. The nares were obstructed completely, apparently from collateral oedema, with a tense and water-logged appearance of the mucous membrane; this did not shrink under cocaine sufficiently to afford a view of the pharyngeal vault. The upper eyelids were puffy especially at the outer third, where they formed a curtain over the eyeball. Eversion of the lower lids showed them to be thickly studded with granular elevations. There were nodules in the cheeks and at each side of the frenum of the tongue. The bridge of the nose was broadened.

Mr. W. had no pain, headache or sensitiveness of the scalp. Syphilitic and alcoholic history was denied. His weight had dropped from 159 to 130, and later it fell to 126½ pounds. He had so-called bilious attacks frequently and such an attack always preceded tarry-stools. His temperature was normal and pulse 80. There was loss of appetite, with marked pallor and depression, fullness of the epigastrium and muscular weakness. His station and gait were normal. The pupils reacted and there was no Romberg. A provisional diagnosis was made of syphilis, and he was put upon the iodides, with inunctions of mercury. April 22, 1901, he had gained 2½ pounds. During the attack of rheumatism, lasting two weeks, his physician reported that the hoarseness with difficulty in swallowing and the swelling of the eyelids improved decidedly, but returned with convalescence. November 7th, his weight had increased to 132½ pounds; November 15th, to 133½, and November 26th, to 134 pounds. December 15th, there was a slight hemorrhage from the stomach and bowels, and January 23rd, 1902, another hemorrhage, which was followed by improvement in the swollen condition of the throat and eyelids. In the three days preceding the hemorrhage, he had had yellow, watery stools, without epigastric tenderness, and following them, the nares became more open, and swallowing was less difficult. His general condition, however, was that of a very sick man. March 4th, the lateral walls of the pharynx appeared more swollen, as well as the central mass, causing choking and much difficulty in swallowing. The lymphatics in the neck, cheeks and eyelids were worse. The uvula, however, was two-thirds its former size and the nares more clear. His pulse intermitted—one beat in seven, and there was marked muscular weakness. The treatment had been stopped three times from intercurrent attacks of influenza which he shared in common with the other members of his family; this interrupted treatment so that it was difficult to estimate its value. May 1st, an examination of the urine and sputum was negative. The blood showed haemoglobin, 75%; reds, 3,568,000; with no increase in the lymphocytes. A microscopical examination had been made May 17th, 1901, by Drs. Mallory and H. C. Low of the Boston City Hospital, from a snipping from the posterior wall of the pharynx; they reported as follows: Gross appearance of a spreading growth on the posterior wall of pharynx, growing down two sides in ridges as large as the little finger. The snipping had been taken from the growing edge, low down. The microscopical description was that of a round celled growth very much resembling lymphoid tissue, showing very few mitotic figures, and of evident slow formation. It had for the most part a definite capsule, but in places is infiltrating the muscle tissue. A large growth would suggest sarcoma. This section was afterwards pronounced undoubtedly lympho-sarcoma.

At this time, the treatment was changed to arsenic and he was put upon Fowler's Solution, which was gradually increased to XV minims T. I. D.; this was continued a year then omitted a year, then resumed for two weeks then again omitted. It was twelve months before there was any objective change which was decided, then the throat was distinctly better, although he was thin and weak and had given up his business interests.

An examination September 25th, 1905, showed no spleen and the general physical condition was negative, except the old heart lesion, which was not giving symptoms. Locally, the naso-pharynx was entirely clear, the bridge of the nose was broad, the lids had just commenced to be puffy again after twelve months of normal conditions, and for this he now consulted me. He had had no hemorrhage for four years. There were no glands, pallor or muscular weakness. His appetite was good and his weight 154 pounds, which was normal. The blood examination was negative, there were no abnormal cells and the leucocytes were not increased. On account of the returning puffiness of the lids, the arsenic was resumed. October 26th there was a hemorrhage from the left naris which saturated two handkerchiefs. The blocking of the nares having partially returned, this then disappeared from the left but not from the right side. A few weeks of the arsenic was followed by a return to the normal. November 17th, the patient was shown at a meeting of the New England Laryngological and Otological Society and the members concured in the probable diagnosis, although there was no clinical evidence at this time of any local pathological process.

During the year ending May 1st, 1906, Mr. W. had been better than for five years. He was of normal weight, good color, bright mentality and able to take active interest in his surroundings, although he had retired from business.

April 13th, while in his carriage house with his son, the suspended shafts of his carriage fell, knocking off his hat and grazing the left naris from which a drop or two of discolored serum exuded. It was not enough to attract his attention until noticed by his son. On Sunday, the skin became red and oedematous, accompanied by a chill and temperature of 102.5. Monday the area became circumscribed and showed fluctuation; it was opened under ether by his family physician, and pus evacuated. One week later, after some joint pains, thick pus was again evacuated. April 27th, he complained of his throat being full. This was followed by a profuse discharge and evidence of collapse. In the afternoon, there was an additional discharge, so abundant that his physician thought he would choke to death, and which he described as a frothy mucus which appeared as fast as it could be wiped from the mouth. May 7th, I saw him in consultation; at this time his temperature was 100, pulse 96, R. 28; pupils contracted; he was delirious, but spoke intelligently on being aroused. Examination did not reveal anything abnormal in the naso-pharynx or throat. On the 10th, I saw him again and his condition was one of coma, from which he could not be aroused. Death followed about noon, apparently from toxemia.

AUTOPSY BY DR. WOLBACH, *Pathological Dept., Harvard Medical School, May* 11, 1906.

Body of a tall, fairly developed, but poorly nourished man. Subcutaneous fat scanty. Rigor mortis present. Slight lividity of dependent parts. No enlargement of lymph nodes.

Pericardial Cavity.—Owing to multiple punctures of all the hollow viscera, this cavity is full of dirty brown fluid and semisolid material. Peritoneum a dull gray throughout. Appendix retrocoecal, free of adhesions, 6 cm. long, with a mesentery to its tip; an ileocoecal band is present. Mesenteric lymph nodes not enlarged; inguinal lymph nodes also noted, but not enlarged.

Pleural Cavity.—A few fairly firm adhesions at left apex and over right lower lobe posteriorly, and anteriorly to the pericardium. No free fluid.

Pericardial Cavity.—Completely obliterated by dense adhesions. (This heart was removed in toto.)

Heart.—Weight 300 grams; contracted; right ventricle and auricle contain a small amount of semi-solid clot. The endo-cardium is smooth and glistening throughout, except for a slight opacity and thickening of one of the mitral segments. All valves appear to be competent. Myocardium pale. Coronaries moderately sclerosed but patent.

Lungs.—Collapsed with thorax. Surface smooth, glistening, light gray color, the lobules being defined by a deeper gray reticulum. Consistence soft and elastic; cut surface smooth and dry.

Liver.—Estimated weight 1600 grams. Surface dark red and smooth. Edges sharp. On section cut surface smooth; an indefinite grayish and brownish mottling with no distinct definition of lobules. The colors shade gradually one shade into the other. Substance fairly firm.

Spleen.—Weight about 175 grams, deep chocolate and bluish tint. Capsule smooth. Edges sharp. Firm in consistence. Cut surface smooth and moist. Malpighian bodies visible as minute, semi-translucent dots, .5 mm. in diameter. Trabeculae well marked. Pulp does not bulge.

Pancreas.—Of normal contour and of uniform, firm consistence throughout. Surface pale gray with indistinct markings of lobules (due to embalming fluid). Cut surface grayish pink, with fair definition of lobules, averaging 1.5 mm.

Gastro-intestinal Tract.—The mucosa throughout is pale and intact, no thickening of the walls. (No evidence of healed ulcer in duodenum.)

Kidneys.—Readily shell out from perirenal fat and areolar tissue. Surface dark chocolate brown in color, and no stellate vessels visible. Capsule peels readily leaving a smooth surface. Cortex pale and measures .5 cm. Medualla dark red. Pelvis not enlarged. One large cortical cyst. 1.5 cm. in diameter found in right kidney.

Adrenals.—Firm and on section show a yellow cortex with a coffee brown central area.

Bladder.—Wall measure about 2 mm. Organ contracted. Mucosa pale gray in color. The right prostratic lobe is enlarged and bulges into the bladder. In the plane of the bladder wall, it measures 3 cm. On section it is firm with a uniform pale gray dry surface.

Arteries.—Intima throughout abdominal and thoracic sorts shows numerous raised pale yellow thickenings.

Lymphatics.—At the base of the tongue immediately behind the circumvallate papillae are two small elevations measuring 1x.5 cm. (One on each side of the median line.) On section the thickening is due to a pale pinkish tissue between the mucosa and muscle. About the middle of the left aryteno-epiglottidean fold near its posterior insertion, is a similar lump of the same size. On section, they both present the same soft consistence and pinkish color. Uvula and tonsils negative.

Head.—Scalp and calvarium normal. On the under surface of the dura over the vertex on both sides is a red granular layer with a few bright and circular patches. The pia is lightly opaque over the sulci; the vessels are empty or contain discolored, hardened granular blood. The posterior half of the left cerebrum is colored bright intense red, due to diffusion of blood pigment into the pia and brain tissue.

Brain.—Estimated weight 1300 grams. Aside from the color of the posterior half of left hemisphere, the surface is normal in appearance. Consistency increased owing to embalming. Pia strips readily form a clear surface. On section nothing abnormal found in hemispheres, except a diffuse red coloration of cortucal and outer portion of white matter over posterior half of the left hemisphere. The consistency is softer here than elsewhere; the vessels contain red blood in contrast to the hardened blood elsewhere. Ventricles are negative. Nothing abnormal found on section of basal ganglia, pons, medulla and cerebellum. Vessels at base show an occasional thickened yellow patch. Middle ears negative. The sphenoidal and ethmoidal sinuses are clear. The mucous membrane is pale, moist. Mastoid cells negative.

Diagnosis.—Chronic pericarditis adhesive.
Chronic fibrous pleuritis.
General arterio-sclerosis.
Hypertrophy of prostrate.

MICROSCOPIC EXAMINATION.

Heart.—Myocardium is negative. The pericardial surface is covered with a deep layer of fibrous tissue, with lymphoid and plasma cell infiltration. In places, there is little hyaline reticular fibrin. There are flattened spaces lined with cuboidal cells, which probably represent the junction of parietal and visceral pericardiums. In places near the myocardium in hyaline detritis and in the fibrin are numerous barred bacilli singly and in short chains. No evidence of acute inflammation.

Lung.—Negative.

Spleen.—Markedly injected. Splenic corpuscles are small, irregular. Arteries show moderate hyaline change.

Liver.—Marked injection at centers of lobules; otherwise negative.

Kidney.—Markedly injected. There are occasional foci of sclerosis in the cortex. There is diffuse swelling of the renal epithelium with filling of tubules with granular detritus (Embalming?). There is an occasional hyaline cast in the collecting tubules.

Adrenal.—Negative.

Thyroid.—Negative.

Parathyroid.—Negative.

Bone Marrow.—(Femur.) Very cellular with small amount of fat. Markedly injected. Contains many multinuclear giant cells, and mononuclear eosinophiles. (Typical active bone marrow.)

Base of Tongue.—The soft tissue found at autopsy consists of lymphoid tissue with germinal centers. The whole covered with stratified epithelium. There are many crypts lined with epithelium and filled with cells and detritus. The structure is that of normal tonsilar tissue.

Aryteno-epiglottic Fold.—There is a large amount of lymphoid tissue beneath the epithelium, containing germinal centers. There are also irregular areas of marked lymphoid cell infiltration in the connective tissue throughout the structure. A piece of the aretymoid cartilage is normal. No evidence of malignancy.

Lymphoid Nodes.—From various sources, negative.

Prostate Gland.—Hyperthophy. No evidence of malignancy.

Cortex Cerebri.—Negative.

SUMMARY OF CASES REPORTED BY OTHERS.

STOERK.

Feb. 3, 1893.—Laundress, 33 years old. She stated that six months previously she had undergone an operation for carcinoma of the breast. During the last six weeks, she has been troubled with progressive dyspnoea. Examination showed both tonsils as large as pigeon's eggs. There was infiltration of the pharyngeal walls extending to the vault. The mucous membrane was pale. The soft palate and uvula were thick and red, and phonation was difficult. The infiltration extended down into the sinus pyriformis on either side and invaded the larynx. When, shortly after, an excision was made for examination, the patient was seized with severe choking, demanding an immediate tracheotomy. This gave relief and the patient seemed improved, but died in the evening of the same day. Microscopic examination—lympho-sarcoma.

Apr. 13, 1891.—Woman of 22 years. The general color was that of pernicious anaemia. For one year, she had had obstruction of the nares and a nasal voice, accompanied by headache and difficult breathing. Examination showed a growth filling the nasopharynx below the level of the soft palate; it was removed with the forceps and currette after splitting the soft palate on one side to the median line. The bleeding was severe. The growth returned a few months later, but the physician refused to do a secondary operation and the patient died one year later.

1892.—Man of 32 years, who gave history of throat trouble for some time. Examination showed ulceration of the posterior portion of the soft palace, with swelling of the greater part of the posterior wall and side of the pharynx. That part of the soft palate above the ulceration was edematous. A diagnosis of syphilis was made and, as there was a history of anti-syphilitic treatment given, this was considered to have been insufficient. Local treatment was instituted with cauterization with Lapis infernalis. This proving of no benefit, an institution was suggested; this met with no favor as the patient was a bridegroom. October 13th, a microscopic section examined by Chiari showed lympho-sarcoma, and on November 1st he was put on Fowler's solution. At the end of November, a swelling the size of a hazel-nut appeared in the right naso-pharynx and at the lower end of the left posterior pillar; the latter showed ulceration. Early in January, a hard swelling appeared under the left angle of the jaw extending into the cheek. At the end of January, the naso-pharynx was full and the swelling extended as far forward as the canine fossa. Death occurred March 18th after an epileptic seizure. Metastases were found in the liver, mesentery, pancreas and retroperitoneal regions.

1893.—November. Late in 1893, a student complained to Stoerk of pain in his throat. Examination revealed an ulcer behind the soft palate on the upper posterior wall of the pharynx. The adjacent structures become swollen. A diagnosis of syphilis was made; this was denied upon his word of honor by the patient and the physician contented himself with an exhibition of the iodides. Acute nasal symptoms appeared and headache. A few weeks later, a specimen showed under the microscope lympho-sarcoma, and Fowler's solution was given. In the middle of December, the tumor was removed by curetting. Pain in the head and ears persisted. In February, a further partial removal of the recurring tumor was undertaken. The rest disappeared spontaneously. Later swellings appeared behind the posterior pillars of the palate and were treated with injections of Fowler's solution and Pyoctanin. By the middle of April the growth had disappeared. Toward the last of April, fever and chills came on and the general infection increased, from which he died May 18th. In the latter part of his illness, no tumor was visible in the pharynx, nor were any glands palpable in the neck.

Stoerk also cites three cases of lympho-sarcoma of the pharynx with no history beyond a microscopic examination and diagnosis.

One a girl of 18 years who for a year had had pain and discomfort in the throat, with difficulty in clearing it of mucus. The pharynx and soft palate were much swollen as far down as the larynx. The epiglottis and sides of the larynx were infiltrated. The patient died two years later.

The second, a woman of 36 years who for four months had had subjective symptoms of a foreign body in the throat with difficult speech. Both tonsils were very much swollen, as well as the pharyngeal walls, where the swelling extended into both naso-pharyngeal fossae. The larynx was not involved.

EISENMENGEN.

A man 23 years old, who for two weeks had noticed a change of voice and obstruction of nasal breathing. During the few days previous, there had been tinnitus and deafness in the left ear. No pain. Mouth breathing, with fetid breath and voice of nasal quality were noted. The right half of the soft palate was pushed forward by a tumor as large as walnut, which was rough and firm without ulceration. The uvula was displaced to the left. The tonsil was normal. The tumor apparently sprang from the posterior wall of the pharynx and sent a prolongation into the naso-pharynx. It was removed with the scissors and sharp curette and the base cauterized with the Paquelin cautery. For a few days, the wound did well and the symptoms improved. Soon headache was accompanied by insomnia. On the eleventh day a right, and on the twelfth day, a left oculo-motor disturbance appeared with loss of vision in the left eye. In one month, the tumor had returned and speedily caused death after symptoms of cranial invasion.

Boy of 14 years.—On the left side of the neck was a large hard irregular mass which was immovable, reaching from the jaw down to the clavicle. The skin over it was stretched and marked by enlarged vessels. The mouth could be opened but 2 cm. The larynx was displaced to the right and immovable. The swallowing and breathing were impeded. A large tumor of the left pharynx and soft palate presented a firm irregular surface. Its extent could not be determined. There was no ulceration, but the mucous membrane bled upon touch. Tracheotomy was performed and the breathing relieved. Arsenic was exhibited internally and subcutaneously, and hyper-osmic acid injected parenchymatously into the growth, but it increased rapidly and the patient died in three months. There was no ulceration at any time.

A man of 21 years, who for four months before had noticed a swelling on the left side of the soft palate, which had come on within a month, but had not increased. Next followed obstructed nasal breathing and difficulty in swallowing. The voice was not clear. For six months, he had cough and marked loss in weight. Recently, food could only be taken in small pieces and chewing was difficult. He complained of dryness of the mouth with constant hawking, especially at night. On examination, his skin was pale and cyanotic. Physical examination was negative. Behind the left angle of the jaw a diffuse hard swelling was noticed, which extended into the sterno-cleido-mastoid muscle. The mucous membrane of the mouth looked dry, also the mucous glands and the papillae of the tongue. On the left a tumor pushed the soft palate down and forward. The tonsil was large but not involved. The uvula was displaced and the entrance to the pharynx very small. A hard tumor was palpable, one part of which was in the soft palate, another less firm, in the back wall of the pharynx extended down to and partly involved the larynx. The choanae was free. No ulceration. Tracheotomy was done and a Trendelenburg tampon canula was inserted through the incision in the cheek, after the resection of the jaw. The tumor was extirpated and the pharynx packed with iodoform gauze. The next morning, after removing the packing, the patient drank water easily. The following night he had chills, followed by death in a few hours. Evidence of tuberculosis was found in the lungs, with a tracheo-bronchitis and lobar pneumonia.

A man of 52 years, who had had pain in the right ear for four months. There was swelling under the ear and of the right palate for two months. The swelling of the palate had increased rapidly, but that of the neck only slightly. For a month, only soft food could be taken, and for one week, the breathing had been difficult. The speech was thick and the hearing in the right ear was impaired. In front of the right ear, the swelling reached to the anterior third of the jaw, and was hard and irregular. The skin was not involved. Beneath the jaw there was a hard swelling as large as a hazel nut. On the right side of the soft palate and pharynx was a tumor reaching forward to the wisdom tooth. The anterior portion was ulcerated. The uvula was pushed against the left side, and the fauces were very narrow. The limits of the growth could not be defined. There was entire obstruction of the nasal breathing. Esophagotomy and tracheotomy were performed, furnishing immediate relief. The tumor was not interfered with. Eight days later, it had disappeared. The pain was gone and only a slight paresis of the right vocal chord was to be seen. The patient could swallow and breathe when the canula was plugged. A few days later, he was discharged apparently well, much to the physician's amazement. Ten months later he returned with all the symptoms present as at his first visit, and the uvula still edematous. The tumor extended down into the pyriform sinus. The gross appearance remained the same. A wedge-shaped piece was excised for examination and two weeks later, the upper portion of the tumor had entirely disappeared. The lower portion remained for some time, together with paralysis of the right chord. Soon there was rapid improvement of the lower portion of the tumor also. Six weeks later, there again appeared a thickening of the soft palate to the right of the uvula and also at the base of the tongue, displacing the epiglottis to the left. The swelling increased rapidly, ulcerated and became necrotic. The patient died a few weeks later from general infection.

BROWN.

Jan. 9, 1903.—A case of lympho-sarcoma (probably of the nasopharynx) filling that cavity and protruding into the nasal chambers; it had been curetted, but returned after three months.

In the discussion, Dr. McBride advised arsenic in large doses. He had seen several cases of lympho-sarcoma disappear very rapidly under arsenic, and cited a case where a very large tonsillar tumor was reduced to almost the normal size by this means. The patient died after a few months, however, of malignant disease of some abdominal organ. There was no post mortem, and no details of the last part of the illness could be obtained.

He referred to another case, showing extensive ulceration of a mass at the base of the tongue, in front of the epiglottis, and a large glandular swelling in the neck. At first, he thought it was specific and it was treated with mercurial inunctions and iodide of potash, without benefit. Then large doses of arsenic were given, but proved useless. The patient refused to allow the removal of a piece for examination, but kept on with the iodide and arsenic treatment for a long time. Later another physician advised cacodylate of soda, and in five weeks the ulcer was healed and the general condition much better. The glands in the neck, however, remained. Later the patient died, but further details were not given.

Mr. Spencer advised a partial removal of the growth and vigorous treatment with arsenic and iodide of potash. He found he had difficulty at times in determining the best preparation to use or one that could be borne by the stomach. In one case, he used hydrochloride.

TILLEY.

Dec. 2, 1904.—A patient 18 years of age, who had been operated upon when a small child for cervical adenitis. In September, 1904, the examination showed the right tonsil much hypertrophied, red, tender and ulcerated. It nearly filled the fauces, enforcing a liquid diet. The breathing was difficult. The glands in the right side of the neck were very large. The patient was at once put on increasing doses of arsenic. In three months the swelling in the tonsil and the glands were entirely reduced. Mr. Tilley considered it doubtful if the improvement would persist, for it is the general tendency of these cases to recur, in which case arsenic fails to be of benefit, but this temporary benefit is really extraordinary.

Commenting upon this, Dr. de Haviland Hall stated that, in view of its marvelous effects in some cases, he always advised the administration of arsenic in large doses. He cited a case of his own in which the tonsillar lesion was entirely cured, but the patient died later of a general lympho-sarcomatosis. The pitiful condition of the last two months of life was rendered worse by arsenical neutritis. The occasional pains were very severe and the exhibition of arsenic did not relieve them. Arsenic has proved to have but a limited value. He considered it fortunate in Dr. Tilley's case that the cervical glands had been removed before the arsenic had been used, as he considered cases in which the glands were affected as less amenable to arsenic treatment. If the glands have been for the most part removed, the remainder will often disappear under arsenic.

Dr. McBride suggested the use of cacodylate of soda in cases where arsenic failed. He reported a case in which a combination of this with iodoform worked well. He reported two cases of lympho-sarcoma in which the tumor in the throat had disappeared under arsenic treatment, but both patients died after a few months of malignant growths in other parts of the body.

BROWNE.

May 10, 1901.—A patient had noticed for six weeks a growing tumor of the pharynx. At this time the tumor was three inches long and occupied the back wall of the right side of the pharynx. After tracheotomy and the introduction of a Hahns canula, he removed the growth which was encapsulated and very friable. It had to be removed piecemeal. Contrary to expectation, the hemorrhage was very slight, there was quick recovery with improvement of his general condition. Microscopic examinations showed a lymphoid, round-celled sarcoma. Browne considered the type of these tumors of the laryngo-pharynx, to be almost always lymphomatous and of low histological malignancy.

ISRAEL.

Jan. 1879.—A woman 65 years of age who, in January, first noticed some deafness with obstructed nasal breathing. Soon the nasal obstruction was complete and swallowing became difficult. The right, sub-maxillary gland became swollen. In October, the glands in the left side of the neck became enlarged, all the symptoms increased, and deafness became marked. The velum was pushed forward by a soft, elastic tumor, which sprang from the posterior wall of the pharynx and completely filled the naso-pharynx, reaching down to the level of the border of the soft palate. The glands in the left side of the neck made a large mass, extending from the angle of the jaw to the clavicle, presenting an irregular, nodular surface of the hardness of a bubo. The sub-maxillary gland under the right side of the jaw was as large as a pigeon's egg. The axillary glands and spleen were enlarged, but the white corpuscles showed no increase. There was no temperature. The pulse was 92. Under arsenic, the swelling of the neck, the pharyngeal tumor, deafness, difficulty in breathing and speaking and cachexia all disappeared. After five months, there had been no return of symptoms.

The arsenic was given by the mouth, and injected daily into various portions of the tumor. The reaction was very marked from the first and was so great at the second treatment that the necessity for tracheotomy seemed imminent. Under ice, however, the swelling subsided. During the first week, it began to disappear, and the post-nasal space was free by the fourth week. The patient was discharged after six weeks.

Between February 18th and April 4th, the patient had taken 28 grams of Fowler's solution by the mouth and 3 8 grams had been injected parenchymatously.

ADLER.

1889.—A case of new growth of the lachrymal gland in a man of 70 years of age was accompanied in the latter stage of the disease by swelling of the hard and soft palate, which impeded speech and deglutition. The histological diagnosis was a small-celled sarcoma. This disappeared under treatment with Fowler's solution. He remarked that the treatment of lympho-sarcoma was difficult.

COMPAIRED.

A woman 41 years of age, showed a tumor of three weeks' growth, spreading over the whole of the central portion of the posterior pharyngeal wall by which the uvula was thrust forward. There was little trouble in deglutition, but nasal respiration was impeded. A histological examination showed lympho-sarcoma. There was no specific history, but the iodides were exhibited and the tumor touched with Lugol's solution. The case was not followed.

PIERRE.

1889.—A man 32 years of age, who, in February 1898, had presented himself with deafness in the left ear since October 1897, and otalgia during the last three weeks. There was left nasal obstruction. An examination of the ear showed the M. T. retracted with an injected malleous. Rinné was negative and Weber to the left. This was evidently an Eustachian obstruction. There was a large amount of mucus in the left tumor, springing from the left lateral wall of the naso-pharynx, obstructing the left choana and extending 1-2 centimeter to the right of the middle line; it was red in color and of the consistency of adult adenoid tissue. The soft palate was pushed forward by the growth, but not involved. There was not much difficulty in speech or swallowing. The growth was removed with forceps and curetted under cocaine anæsthesia. Little bleeding followed. Three days later, the patient was suffering severely with pain in the ear. The soft palate was still pushed forward and grumous mucous secretion was discharging down the left side of the pharynx. Three weeks later, the patient's condition was lamentable. At the union of the pillars, there was evidence of an abscess as large as a two-franc piece, painful to touch. The soft palate was paralyzed, as well as the entire left side of the face. The left arm showed paresis, movement being possible but slow and powerless. The general condition was weak, and color pale. He had great pain in the side of his head, neck and ear. The left parotid region was very hard and painful to touch. Sleep was practically impossible. He was poorly nourished on account of vomiting. Histological report,—lympho-sarcoma. By April 24th, the tumor was very large and deglutition difficult. The patient died May 3d of asphyxiation.

SCHNITZLER.

1889.—A man 48 years of age had had some difficulty in swallowing for one year. Examination by a physician revealed a white coating of the left tonsil, which looked like diphtheria; under nitrate of silver it cleared away, but returned again in three weeks when similar treatment again cleared up the ulceration. A month later the swelling had returned and invaded the soft palate and pharyngeal wall. During some months later, he was seen by various physicians in Wien and Moscow, most of whom considered the case specific but pronounced it malignant. His speech had a nasal quality. The uvula was displaced, and the soft palate and pharyngeal wall infiltrated. There was no cervical adenitis, but the sub-maxillary glands were somewhat swollen. There was marked destruction of the pillars of the soft palate and posterior wall of the pharynx. A dozen inunctions with mercury gave no result. A microscopical examination of a section of the uvula showed doubtful, small-celled sarcoma. The epiglottis and base of the tongue became involved, and still the majority of physicians considered it specific. The breathing and swallowing became difficult, and two months later the patient succumbed in spite of tracheotomy. A post mortem examination showed clearly the lympho-sarcoma.

VON LIENART.

November 11, 1905.—A patient 40 years of age suffered from progressive obstructions of nasal respiration, accompanied by tinnitus. The right post-nasal fossa was completely filled with a reddish tumor as large as an egg, springing from the upper and posterior wall, and partly filling the left side. Lymph glands and spleen were enlarged. The leucocytes were increased; hæmoglobin 70 per cent. A section of the tumor growth showed typical lymphoid tissue.

M. Donozany recalled a similar case in 1896, but without splenic enlargement. A microscopical examination showed lympho-sarcoma.

SCHMIEGELOW.

March 29, 1905.—A woman 68 years of age had difficulty in swallowing and could only take liquids at the time of her entrance to the hospital. The lateral walls of the pharynx, the tonsils and fauces showed a hard, non-ulcerated growth which invaded the base of the tongue. The glands were enlarged. A section from the tonsil showed malignant lymphadenoma. A number of injections of cacodylate of soda brought a certain amount of relief, but arsenic was not well borne. A trial was made of X-ray treatment and the result was quite remarkable. At the time of the report, there was only a vestige of the tumor remaining, and the glands had entirely subsided.

Bosworth, reports the case of a man 42 years old, whose physician had noticed for six or eight months, at first a fullness of the naso-pharynx, and later an obstruction with marked catarrhal symptoms. The treatment was for that of naso-catarrh, before the seriousness of the condition persuaded his attendant that it was time to see Bosworth. En route, the case was seen by Drs. Cohen and Porter who agreed upon its malignancy and sped him on his way.

A hard, dense, irregular mass filled the naso-pharynx and caused bulging of the soft palate. A grumous secretion bathed the surface. For four months, pieces were removed with the snare and the galvano-cautery was used. The use of the cautery, however, was followed by marked reaction and gave discouraging results. The latter part of the treatment with the snare alone was most encouraging. A microscopical examination at the beginning of the treatment showed lympho-sarcoma. A later section was reported as round-celled sarcoma, or globe-myeloma of a very malignant type, and a prognosis of a rapid course and a fatal issue was made. After a little over four months of treatment, the tumor was entirely removed and had not recurred after seven years.

SUMMARY.

Lympho-sarcoma observed over a period of five years. Effects of Arsenic apparently marked in the early stages without glandular involvement. Good observers have also shown as marvelous cures surgically without medicinal treatment. Provisional diagnosis of syphilis usually made in the early and carcinoma in the later stages.

A microscopical examination of extirpated tissue the only reliable means of determining its character.

Report of cases by others.

Death from toxemia following a slight injury.

Autopsy by Dr. Wolbach showing an anatomical cure of the sarcoma, which was observed over five years.

657 Boylston St.

Caseous Maxillary Sinusitis. R. H. JOHNSTON, (Baltimore) *Med. Fortnightly*. Apr. 25, 1907.

Johnston relates two cases of his own where the patients presented typical caseous masses in the antrum; in both recovery was prompt with lavage. The odor of the pus was more foul than in ordinary antrum disease, while the symptoms were practically the same. In the first case the cavity was punctured in the inferior meatus and washed out with sterile water. Cultures from the large caseous mass showed the micrococcus tetragenus. After a few washings with boric acid solution, the pus ceased.

In a second similar case the staphylococcus pyogenes albus was found in pure culture. The prognosis is much better than in cases where the pus is liquid or semi-solid. EATON.

A REPORT OF A CASE OF FIBRO-MYXOMA, INVOLVING THE LEFT SUPERIOR MAXILLA, INCLUDING THE ALVEOLUS, FLOOR, ANTERIOR AND POSTERIOR WALLS, AND OF SEVEN YEARS DURATION.*

BY W. H. HASKIN, M.D., NEW YORK.

The knowledge of the life history of this peculiar form of growth appears to be very limited, and after considerable research I was unable to find any literature to assist me in the care of this patient. It seems to me that the duration and the persistent recurrence after repeated attempts at removal with curette and cautery, and the fact that it could not be classified as an encapsulated tumor, for it ramified in all directions and completely absorbed the bone in many places, point to a much more serious condition than is generally accepted for a fibroma. At the time of my operation there was decidedly more myxoma present than fibroma, and judging from the history given by the patient I believe that has always been the case. The freedom from pain, the absence of any tendency to suppurate (the surface always healing over after previous operations), and the lack of any lymphatic involvement contra-indicate malignancy; but, notwithstanding these facts, the ramifying nature, the recurrence and the gradual loss of weight of the patient seem to indicate a serious condition, the true nature of which we have not yet grasped; and it is with the hope of learning more of its nature that I present this, to me, most interesting case.

The patient, Miss H. M. H., was brought to my office on February 2nd, 1907, by Dr. A. F. Bauer, a former student of mine at the Dental College, with the following history: Family history excellent, both parents and two brothers being alive and in good health. Several years ago she suffered with menorrhagia and was cured by currettement. With that exception her history was good, and she had never been ill to her knowledge.

The following letter is the patient's own description of her case: "About the Fall of 1900, while having some dental work done by Dr. F., of New York, I called his attention to a wisdom tooth that was troubling me. He lanced it, and later, I believe, he lanced it a second time. In February, 1901, I consulted a dental surgeon of

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* Read before the Thirteenth Annual Meeting of the American Laryngological, Rhinological and Otological Society, New York City, May 30, 31, and June 1, 1907.

Brooklyn in regard to having a tooth straightened. He at once noticed a small enlargement over or near the wisdom tooth, and called my attention to it, saying it ought to be attended to. I believe he then removed the tooth. Upon my return home I saw our family physician of Newark, in whose hands we placed the matter for treatment. In February, 1901, he sent some of the growth to the Board of Health of Newark, N. J. They pronounced it to be ————? and not malignant. The physician continued his treatment of it, cutting out at times considerable masses of it, hoping thus to check or destroy the growth. For a time it did not seem to be enlarging, and it caused no discomfort, so little attention was paid to it. But in April, 1904, it became worse and was again treated when it was necessary to remove another tooth. From that date until February, 1907, it was not treated.

For two years nothing had been done, and as there was no pain the patient did not realize the serious nature of the condition until she consulted her dentist again, who immediately advised her to see a surgeon and referred her to me. For some months she had been unable to masticate on the left side, and occasionally had some dull aching on that side, but otherwise was not inconvenienced. She had at times noticed some puffiness under the left eye, but close questioning did not elicit any history of nasal discharge at any time. There had been a slowly developing mass appearing under the malar bone, but not until recently had it caused the left side of the face to appear fuller than the right. As said before, there was no actual pain, but at times there had been some dull aching on that side. From without the tumour felt hard and unyielding. Examination of the mouth revealed a great thickening of the alveolus from which the last two molar teeth had been extracted. The thickening extended forward to the canine tooth and inwardly over the palate process to within one-half an inch of the median line. Externally it bulged out forming a tumour the size of half an English walnut, with a hard bone-like wall, which extended upwards to and apparently involved the malar process itself. Along the free border of the alveolus the mass felt soft and fluctuating and appeared somewhat translucent. The first molar and the second bicuspid were very loose in their sockets owing to the absorption of the alveolar bone tissues. An X-ray photograph shows this absorption very plainly. The nose was found to be in perfect condition and also the throat. Transillumination was negative, both antra showing light. On February 11th, 1907, under cocaine and adrenalin anaesthesia administered hypodermically, I made an incision along the free border of the alveolus, expecting to find a cyst. I found the fluctuation was due to the presence of a large amount of a semi-solid gelatinous mass, grayish pink in color, and I removed some of this for microscopical examination. The molar was then extracted and a probe was readily passed into the antrum through a root, it being found full of a soft growth. There was very little hemorrhage. The wound was packed with iodoform gauze, and the patient returned to her room to await the report of the pathologist. This was received on the 14th, and was as follows: Fibrous and epithelial hyperplasia in one piece of tissue submitted. In another piece there is a matrix of homogeneous groundwork taking haemotoxylin stain, and in it are a number of finely wandering embryonic connective tissue cells. Diagnosis:—Fibro-myxoma.—Dr. J. WRIGHT, Pathologist.

On the strength of this report I advised complete removal and on February 26th this was done at the Manhattan Hospital, with the assistance of Drs. H. Smith and G. H. Ward. The operation was performed through the mouth, the floor, anterior wall and most of the posterior being removed in reaching the limit of the growth. It extended into the apex of the antrum, but in this region it was not attached, seeming to shell out rather easily, and the roof and inner wall of the antrum did not appear to be involved in the growth. Having dissected the periosteum from both the anterior wall and the palate process, these were removed together with the entire alveolar process up to the lateral incisor. The greater part of the palate bone was removed exposing the muscles and opening the zygomatic and even the pterygoid-maxillary fossae, the delicate fatty tissue protruding into the wound in these regions. Having avoided the tuberosity and the posterior wall until the last, on account of the palatine arteries, there was but little hemorrhage, the growth itself being singularly non-vascular. The involved bone was very soft, as though absorbed, and was easily removed with curettes. The growth also seemed to shell out in large masses, especially where the myxomatous tissue predominated. The greatest difficulty was found at the tuberosity and along the posterior wall, but this was overcome by using a large, powerful, round fenestrated tonsil punch, of German make, which cut through the softened osseous tissue with ease. In all, I should say, the growth weighed between two and three ounces, though possibly more. No opening was made into the nose or the orbital cavity, and fortunately the soft palate was not involved, so that there was no opening in that region. The cavity was packed with iodoform gauze, no attempt being made to introduce sutures. Dr. Wright reported again that the growth was fibrous-myxoma, with no evidence of sarcoma.

Subsequent history: Uneventful. Three months after operation the extensive cavity had entirely closed with apparently healthy tissue. The patient had gained in weight, and was being fitted with an endenture.

The literature on growths of this nature is exceedingly scant, as said before, being merely mentioned in the classification of tumours in most text books. The American Encyclopedia of Medicine says about them: "Fibrous-myxoma usually occur in the region of the alveolus. When arising from the alveolus adjacent to the antrum it may project into that cavity and appear to be growing from it. These fibromata are considered by Bland Sutton to be of the same origin as odontomata. Some people consider that they may result from chronic inflammation around the apex of a tooth." Garretson, Marshall and Grant, in their books on the surgical diseases of the jaws,—books that are used as text books in the Dental Colleges, make no mention of these growths. Dr. Wright has written extensively on nasal growths which have been generally regarded as of this nature. Posey and Wright do not mention it. Kyle mentions it as appearing in the nose.

The most extensive description that I could find, however, is in The American Practice of Surgery, by Drs. Bryant and Buck:

"Myxomata are tumours of mucoid character. Structurally they are composed of cells floating in a homogeneous, semi-fluid mucinous matrix. These cells are mononuclear, bipolar or stellate, and provided with more or less elongated protoplasmic processes which interlace freely. The intercellar substance varies in amount in different tumours and in different parts of the same tumour. When abundant, it gives a characteristic gelatinous, semi-fluid, somewhat translucent appearance to the growth. Myxomata are grayish, or pinkish gray in color, owing to the presence of blood vessels that are more or less distinctly visible in the substance. On section, a jelly-like or ropy substance—mucin—exudes, which is not soluble in water, and gives a whitish precipitate with alcohol or dilute acetic acid.

Myxomata are rarely pure in type, but are usually combined with other tissues of a homologous nature. Mucoid tissue is closely related to fibrous tissue. The truth of this is evident when we re-

member that in the foetus the fatty tissues and fibrous tissues are first blocked out in mucoid material. Consequently, myxomata are commonly met with in the same regions from which fibromata and lipomata also spring. Further, mucoid tissue occurs in the adult body only in the vitreous humor of the eye, from which structure myxomata never develop.

Myxomata, therefore, always exhibit a certain deviation from the tissues in which they are found. In other words they are heterologous within narrow limits. The embryonic character of the cells also explains the well known instability of the tumour, which, though classed among the benign growths, has a tendency to take on malignant action, the transformation occurring in the direction of the sarcoma.

True myxomata have to be distinguished on the one hand from tumours, such as fibromata, sarcomata and carcinomata, that have undergone secondary mucinous degenerations; and on the other, from growths that, owing to vascular disturbance, have become oedematous. Myxomata (fibro and lipo) may originate in the connective tissue of the skin, fascia, periosteum, mucous membranes, and muscle sheaths; in the subcutaneous and subserous fat, the bone marrow, and occasionally, in the mamma, salivary glands and testis.

Myxomata of the mucous membranes occur singly or as multiple primary tumours. The ordinary mucous polyp of the nose is a good example of these growths. Myxo-sarcomata, so called, are due either to a cellular transformation of a simple fibro-myxoma, or to the mucinous degeneration of a sarcoma. They behave as sarcomata and form metastases."

This last account, as will be seen, gives an excellent description from the laboratory standpoint, but does not deal with the history of the growth, its effect upon the general health of the patient, the prognosis, or the best method of dealing with it. In this case we have a tumour of at least seven years duration, practically painless with no glandular enlargement, but extending out in many directions, apparently non-encapsulated, and destroying the bone tissues which it invaded very much as would a malignant growth. Again it has repeatedly healed after curettement and has never shown any tendency to ulcerate, both of which facts rather disprove the thought of malignancy. Dr. Wright's report, having been made after examination of several pieces of the growth, also indicates the benign nature; and yet the question is, where can we draw the line between benign and malignant tumours? It seems to me that any growth that can so effectually absorb bone tissue, that returns repeatedly after operation (the thoroughness of which, however, I cannot vouch for), that appears to be without capsule and ramifies in bone, muscle, open space and fibrous tissue alike, does not belong in the benign class, and should be considered more seriously than has been done up to the present time. Bland Sutton's theory of a pericementitis being the cause or the starting point may seem to be borne out in this case, as its history of wisdom toothache preceded the growth. Dr. Cramer first noticed it while filling a cavity elsewhere and advised that it be attended to. If there is no recurrence after this extensive removal, it will be very easy to fit an obturator over the remaining cavity, with attachments to the opposite side, and with a complement of teeth that will give use for mastication, and at the same time will support the cheek if there should be much sinking in.

42 E. 41st St.

Some Experiences in Intubation and Tracheotomy. J. K. COUCH, (Perth, W. A.) *Australasian Med. Gaz.*, June 20, 1907.

The writer of this paper states that "it is a bad omen for the success of these operations," if the supraclavicaular and epigastric areas do not markedly recede or fall in with inspiration, and maintains that if one is in doubt whether the operation should be performed, operate; do not wait.

In intubation cases he claims that one can save the majority of cases if a tube is passed as soon as signs of laryngeal obstruction are sufficiently severe to cause indrawing of the supraclavicular and epigastric regions; but if one waits until edema of the lungs and broncho-pneumonia have set in, the results are not any better than those of tracheotomy.

He further urges that mishaps usually occur during tracheotomy from too much haste, and quotes a very good rule of Mr. J. Berry: "However bad a child's breathing may be, it is probable that it has another 20 minutes to live," which, remarks Couch, is sufficiently long to do the operation carefully EATON.

INTRACRANIAL LESIONS OF OTITIC ORIGIN.*

BY JOHN J. KYLE, M.D., INDIANAPOLIS, INDIANA.

The repetition of an established fact may be considered by some as a waste of valuable time in a society of this character; however, the perception of new ideas and the application of old truths usually follow such a résumé, and with this hope in mind, I shall endeavor to briefly review the past history of intracranial lesions of otitic origin without any effort to analyze each separate lesion or burden the society with the long scientific treatise necessary for a complete illumination of this subject up to date.

In a review of over three thousand references to disease of the ear and its sequelae, now in the Surgeon General's office of the U. S. Army, I was much impressed with the above subject both in its historical and its surgical aspect. It is interesting to know that many of the contributors were pioneers in the science of Otology, and have long since passed away.

Among the illustrious names, is that of Zaufal, of Prague, who in 1880 (*Prag. med. Wochenschr.* 1891, No. 3.) was the first aurist to remove a blood clot from an infected lateral sinus, and taught us the efficiency of ligation of the jugular vein for the prevention of metastatie infection.

According to Politzer (page 615), Lane, of London, nine years later, was the first to report a cure of a case of sinus thrombosis by operation (*Brit. Med. Journ.*, 1889). Since that time, and especially in the last five years, a growing number of successful operations have been reported. However, this morbid process was recognized many years before, as shown by contributions from Weil in 1859, Sexton, in 1865, and others.

In a consideration of cerebral affections due to otitic inflammation, which may often preceed or follow any operation upon the ear, the avenue of extension is of importance and may, by metastasis or direct extension by continuity of tissue, be through the roof of the tympanic cavity, the mastoid antrum, the mastoid cells, the internal ear, the internal auditory canal, as reported by Pierce and Toynbee, the aquaductus Fallopii, the carotid canal, by way of the foramina for nutrient vessels to the middle ear, communicating veins with the jugular fossa, the foramen for the auricular branch of the vagus nerve and the fissure of Glaser, which contains the tympanic branch of the internal maxillary artery, by the vascular interspaces between the unossified and the ununited osseous portion of the temporal bone, especially in infants, and by the small venules traversing the mastoid region.

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* Read before the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., September 26, 27 and 28, 1907.

The site of necrosis and osseous perforation, and subsequent infection may be through the tegmen of the tympani et antri and the sigmoid groove, but is more frequently through the tegmen of the tympani et antri; thus, an abscess in the temporo-sphenoidal lobe is much more frequent than in the cerebellum.

Cerebellar abscesses are, according to Whitehead, more often due to disease of the petrous bone, generally involving the labyrinth, and less frequently due to sinus thrombosis.

The bibliographical references observed by the author show twice as many abscesses in the temporo-sphenoidal lobe as in the cerebellum. The above statistics may, however, be far from the truth, for Politzer quotes Körner's observation in one hundred cases in which sixty-two per cent were in the cerebrum and thirty-one per cent in the cerebellum, with a simultaneous involvement in six per cent.

Dr. Thomas J. Harris, in a review of twelve thousand seven hundred and forty-four cases of suppurative ear disease in the Manhattan Eye and Ear Hospital, found that sixty cases suffered from meningitis, twenty-three from sinus thrombosis and seven from abscess, in six of which cases, the abscess was located in the temporo-sphenoidal lobe, and one in the cerebellum.

Gowers says that suppuration appears four times as often in the cerebrum as in the cerebellum, and rarely in the pons or medulla oblongata.

It is also interesting to note in the bibliography at my disposal, that thirty cases of otorrhoea cerebralis are reported; Hoffman reports one case in 1827, Albers in 1837, De Boun in 1838, Muckel in 1839, etc.

In regard to otorrhoea cerebralis, Macewen says that a condition of this character might actually become established, provided one understands by that term, leakage by pathological processes from an abscess in the brain, through a preexisting osseous erosion, by which the infectious matter originating the abscess entered the cerebral tissue.

Gruber relates a case in which a cerebral abscess emptied into the middle ear, which, in his opinion, was previously healthy.

Among the intracranial lesions which may originate from the ear and its adenexa, are tumors, cholesteatomata, acute or chronic cerebral or cerebellar abscesses, leptomeningitis, pachymeningitis, basilar meningitis, epidural abscess, sigmoid sinus thrombosis, jugular and sinus thrombosis, sinus phlebitis, cavernous sinus thrombosis, brain tumors, local cerebral softening, caseous degeneration, gangrene, thrombosis of the cerebral tissues, ulceration of the brain and primary bulb thrombosis. The last condition, however, is one open to question, as one may infer from reading the discussion of Arnold Knapp's paper before the Otological Section, New York Academy of Medicine, February, 1906.

Among those who especially advocate the theory of primary bulb thrombosis, are Randall and McKernon, who believe the disease to have extended to the bulb from the floor of the tympanic cavity, especially in children suffering from acute otitis media suppurativa, and is more often observed where the jugular bulb is in close proximity to the floor of the middle ear. The opponents of this theory believe that a microscopical absence of disease in the mastoid process is no evidence that septic micro-organisms have not reached the sinus wall by metastasis, and that bulbar thrombosis is purely a secondary inflammation. Personally, I can see no anatomical or pathological reason to doubt the possibility of primary jugular thrombosis.

The character of infection extending from the middle ear varies according to the cause producing the ear lesion, and may be mono-bacterial or poly-bacterial. Intracranial lesions not alone originate from suppurative lesions of the ear, but may be due to infection from non-suppurative inflammation (Donivan, Trans. Maine Med. Ass'n, 1884).

The infectious organisms observed in brain disease of otitic origin are the streptococcus pyogenes aureus, staphylococcus pyogenes aureus, tubercle bacillus, Eberth's typhoid bacillus, Klebs-Löffler bacillus, the bacillus diplococcus intercellularis of meningitis, and the pneumococcus.

Alport (*Chicago Med. Record,* 1906) quotes Von Bergmann as expressing the opinion that no brain abscess occurs without the presence of streptococcus pyogenes aureus. However, Alport does not accept this view. In one case observed by the writer (*Ann. of Otol., Rhinol., and Laryngol.,* 1906), abscess of the temporo-sphenoidal lobe, contained only pure staphylococcus pyogenes aureus in the pus.

In brain abscess, we usually have one or both of the above organisms, sometimes combined with saprophites and the same may be said of leptomeningitis, pachymeningitis and sinus thrombosis.

As a rule, septic infection of the brain extends directly or indirectly from a suppuration in the middle ear; however, it must be noted that a primary inflammation of the mastoid cells may occur from metastasis or traumatism, as observed by Snydocker and others, and extends directly to the cranial cavity without involvement of the middle ear.

Macewen, in his valuable works on pyogenic diseases of the brain, asks the question, can an abscess in the brain form from an infective otitis media purulenta and remain *in situ* while the middle ear disease becomes cured? and says such a condition is highly improbable and reports a case by Gruber, witnessed by himself, which showed at least that healing had taken place in the external part of the ear while the abscess existed in the brain.

Matthewson (*American Jour. of Otol.,* 1882), reports a case of abscess of the cerebellum, following otitis media, months after an apparent cure.

In a case observed by myself, the abscess in the temporo-sphenoidal lobe occurred nine years after all discharge from the ear had apparently ceased. Macewen's question can thus be answered, I believe, in the affirmative.

Cerebral complications may terminate in resolution or in death. The most fatal of all cerebral complications from otitic infection, is purulent leptomeningitis, and especially is this true where there is a general infection.

Infectious pachymeningitis, and extradural, cerebral or cerebellar abscess usually recover if detected early and operative measures are instituted. The results in infective sinus thrombosis are often more favorable, especially if there exists no secondary infiltration in the lung, liver, heart or kidney. Many cases of pyemia from septic sigmoid sinus thrombosis are reported as having recovered. My results have been unsatisfactory. In five cases operated upon during the past two years, four died and one recovered. One died of metastatic abscess of the lung, complicated with endocarditis, one from a general pulmonary metastasis, and the other two from purulent leptomeningitis. These cases all followed acute suppuration in the middle ear.

The termination of a brain abscess, after the exciting cause has been removed, may be in a number of ways, such as rupture, flooding the meninges, absorption, or encapsulation. Abscess cavities in the brain may rupture through the roof of the tympanum or mastoid antrum, as shown by Heath and also by Hawkins, in 1835 (*London Mag. and Gazette*). The abscess may drain through a fistula in the mastoid process externally, or internally to the process, into the neck muscles.

The early diagnosis and evacuation of pus by surgical measures, is the ideal termination of an intracranial abscess.

Macewen has accentuated a point which may be opportunely referred to, and that is the danger which may follow the removal of polypi of the middle ear, on account of the frequent connection of such growths with a suppuration in the cranium or meninges.

Contour (*Bull. Soc. Anat. de Paris,* 1842) early reports a case of abscess of the brain following polypus of the ear. Removal of polypi and granulation tissue may also permit new infection to pass through bony erosion, to the meninges. The literature on the subject contains a number of references to this point, as well as the danger of forcing fluids into the middle ear in cases of chronic suppuration and of having the fluids pass into the meninges or abscess cavity, thus producing an active inflammation and probably death.

It is beyond my ken to give hard and fast rules for differential diagnosis of intracranial lesions: the subject is too extensive for me to even begin and in consequence, any further consideration of the subject will be limited to meningitis and sinus thrombosis.

Meningitis may imply pachymeningitis or leptomeningitis, however, the latter lesion is implied in a discussion of meningitis. Meningitis may be purulent or serous; on account of the varied degree of the latter lesion encountered originating in the ear, it is really of more prognostic interest than the cerebral or cerebellar abscess. The differentiation, everybody admits to be frequently difficult.

Meningitis due to infection from the pneumococcus runs a much more rapid course, five to six days, than that due to infection from the diplococcus of Weichselbaum, or the tubercle bacilli, which may run a long course, varying from a week to two or three months. In favorable cases, however, the improvement usually begins after the first week.

Cerebrospinal meningitis is presumed to be due to the diplococcus intracellularis alone.

Meningitis may be due to single or double infection, which may be caused by the diplococcus of meningitis, the staphylococcus or streptococcus pyogenes aureus, the pneumococcus, typhoid bacillus, bacillus tuberculosis, gonococcus as observed by Trow as a cause of mastoiditis (*Canadian Pract. and Rev.*, 1903), the Klebs-Löffler bacillus, the streptococcus of erysipelas, the grip bacillus and unknown bacteria. The tubercle bacillus or the diplococcus intracellularis meningitidis of Weichselbaum may multiply and remain within a suppurating ear, causing a condition of slumbering mastoiditis, which for years produces a slight irritation of the meninges, only awaiting an attack of influenza, pneumonia, typhoid fever or some disease sufficient to lower the resisting power of the meninges to bring this severe complication.

Meningitis occurs more frequently in men than in women, the frequency of the disease having no relationship to epidemics of meningitis, but occurring at any time or season of the year.

The predisposing factors of the disease are a general lowering of the vitality of the individual, and extension of suppuration, especially in the mastoid and labyrinth. Meningitis of otitic origin differs from the ordinary meningitis, or cerebrospinal meningitis, in that the disease is seemingly free from the tendency to spread to other individuals. The contagiousness or infectiousness of the disease of otitic origin has never been observed by the author, whereas in the idiopathic form of the disease, its contagiousness has always been marked and every precaution taken to prevent its spread. The meningococcus may extend to the ear and meninges direct from the mucous membrane of the nose and throat of the individual, and in exceptional cases, from the operator or nurses in attendance at the operation. It is a good rule while operating upon the ear in severe suppurative disease, to protect the face of all present and actively engaged in the operation, with moist sterile or bichloride gauze.

The following analysis of a case will illustrate a condition found in slumbering mastoiditis and irritation of the meninges, at times sufficient to impair the memory and seriously retard the education of the individual because of the accentuation of the irritation upon close application to study.

Case I. Chronic discharge from the left ear for eight years; no odor to slight discharge which was detected glazing the inner tympanic wall.

Blood examination, by Dr. W. T. Dodds:

Red cells	4,536,000
White cells	10,000
Polymorphonuclear variety	8,800
Mononuclear variety	600
Lymphocytes	400
Transitionals	200
Hemoglobin	393
Color Index	102

Microscopical examination of pus from middle ear: Large cuboidal epithelial cells; many pus and mucous corpuscles; staphylococci in abundance and a diplococcus intracellularis meningitidis, the latter being in the pus cells.

Urine—Two per cent urea, excess of chlorides, uric acid and urates.

The above examination with subjective symptoms, showed necrosis in flat bone and general absorption, with a disposition to cerebral complication. Meningitis serosa is but a short step from meningeal irritation due to middle ear suppuration. The serous meningitis of Quincke in complication with acute otitis media or accompanying or following a mastoidectomy, is an especially interesting condition, first, because of the alarming symptoms, and second, because of the favorable outcome, many times, of the disease. Serous meningitis of Quincke is suddenly, during the otherwise seemingly satisfactory course of the disease, ushered in with a high temperature, rapid pulse, delirium and symptoms of pressure in the posterior fossa. There may be present optic neuritis and strabismus.

In one case observed by the author, one week after simple mastoidectomy following acute otitis media purulenta, there was delirium for two weeks, with a temperature varying from 100 to 105 degrees. In this case, no operative measures were resorted to and the patient made a perfect recovery. Cerebral symptoms of pressure were present though not profound. There were present high temperature, delirium and a rapid pulse, though no optic neuritis. A condition of this character was evidently metastatic and due to the organism producing the mastoiditis, the streptococcus pyogenes aureus or its toxins. The blood examination showed a high leucocytosis, with abundance of polymorphonuclear leucocytes. In this case, a purulent discharge persisted from the mastoid wound for two months, completely disappearing with perfect healing of the wound.

According to Quincke, any operation made into the arachnoid space will be followed by a cure.

Ballance, in a discussion of a paper by Dench, on treatment of intracranial complications of middle ear suppuration, read at the Section on Laryngology and Otology of the A. M. A.. June, 1906, said there is a rise of temperature, slowing of the pulse, vomiting, dizziness, stability of the pupils and some redness of the optic disk, and that the condition can be relieved at once by lumbar puncture. Dench (ibid) said, "I am inclined to believe that the best plan of treatment is to relieve the pressure by lumbar puncture and failing in this, to relieve the increased pressure by craniectomy, followed by an incision of the dura and of the cerebral substance." He also said he believed it better, provided the ventricular distension was not sufficient for free drainage after brain substance had been penetrated for the distance of an inch, to simply incise the brain substance.

In addition to the symptoms enumerated by Ballance, the general symptoms are headache, delirium, muscular twitching of arms and legs, grinding of the teeth, involuntary discharge of urine and the feces, contraction of the muscles of the neck, contraction of the pupils, injected conjunctiva, and hyperesthesia of the muscles of the neck and calves of the legs. In very young children epileptiform convulsions and opisthotonos may be first symptoms of the disease, with now and then a peculiar "hydrocephalic" cry. The temperature may vary from 100 to 106 degrees, and the pulse from fifty to one hundred twenty per minute, with a tendency to drop to the lower figure.

Kernig's sign is usually present, i. e., an inability of the patient while lying on his back, to flex the thigh without at the same time flexing the leg, and also the inability to completely extend the leg.

Trousseau's sign may also be present as shown by the contraction of the muscles of the upper extremities, following pressure upon the tendon of the biceps.

In enumerating the eye symptoms observed in meningitis, I can do no better than report the compilation on the subject, by Robert B. Preble (*Progressive Med.*, Vol. VIII, No. 1).

"Heine reports a study of the eye disturbance in epidemic meningitis based upon a study of one hundred cases. Disturbances may appear in the motor apparatus, the sensory tracts or the nutrient portion of the eye. One should not include here the cases of conjunctivitis, and the like, which sometime develop in the course of this, as in other severe infections, when the patients lie unconscious with half open eyes, for a long time.

"Hemorrhages into the retina are seen very much less often than simple intraocular optic neuritis. This is more often due to a descending neuritis from the basal meningitis. Sometimes there is a neuritis of the optic nerves behind the bulbs and without ophthalmoscopical findings, unless optic atrophy results. The frequency of secondary optic atrophy is not yet determined for want of sufficient statistics.

"Metastatic ophthalmia is seen and is usually severe.

"Involvement of the motor oculi nerves also occurs. They are almost always basilar in origin, more often unilateral than bilateral, and oftenest the abducens paralysis. Not rarely, one sees a more or less complete paralysis of all the eye muscles. Ptosis is strikingly often absent. The milder cases often recover completely.

"Of the one hundred cases examined by Heine, twenty showed eye symptoms which totaled thirty in number. There were nine cases of unilateral or bilateral optic neuritis or retinitis, thirteen with motor paralysis and five with ophthalmia."

Blood examination in meningitis shows a high leucocytosis, varying from 40,000 to 47,000 (Emerson), and according to Preble, there is no material difference in the counts shown by the cases ending fatally and those which recovered.

Lumbar puncture in meningitis serosa or purulenta is a proper procedure for two reasons; first, a relief of the pressure in the subarachnoid space and ventricles, and second, as a diagnostic measure. The fluid, is described by Schottmuller, may be perfectly clear in meningitis, ranging from that to a cloudy or purulent fluid. The cocci vary in number, the number having no relationship to the color of the cerebrospinal fluids. In brain abscess, the cerebrospinal fluid is clear and free from cocci.

According to Lenhartz, the amount of fluid to be withdrawn is from twenty-five to forty c. c. at each sitting and should be performed daily.

Sinus thrombosis may involve the lateral, sigmoid, or jugular bulb. All three divisions may be involved at the same time, or the inflammation may confine itself to one structure, beginning at the torcular Herophili and extending the entire length of the jugular vein of the affected side. Other sinuses may become involved secondarily from metastasis.

In diseases of the jugular vein and sinus thrombosis, there may be present metastatic infiltration in the lung, liver, kidney and heart.

The disease is usually ushered in by rigors, which increase in number and severity and are followed by profuse sweating. The temperature is very high, differing thus from meningitis, ranging from 100 to 106 degrees F. The pulse is exceedingly rapid, and as the infection increases, becomes weak and thready. There is rapid emaciation and toward the fatal termination of the disease, involuntary voidance of urine and feces. Abscess of the lung or liver accompanying the disease may rupture, causing the sudden death of the individual.

Early in the disease, there is pain in the region of the thrombus upon pressure or percussion. Though this symptom may be entirely absent, we not infrequently have tenderness upon pressure, swelling of the tissue over the mastoid and muscles of the neck. The important symptoms differentiating sinus thrombosis, are severe chills, followed by profuse sweating, absence of the characteristic pain in the ear and head, as observed in meningitis and brain abscess, and high temperature, usually lower in the morning and higher in the afternoon.. The intellect is clear during the early stage of the disease and before profound pyemia is established. The disease usually terminates in from two to three weeks.

Blood examination shows a high percentage of polymorphonuclear leucocytes.

The treatment of the disease varies somewhat, according to the extent of the lesion. My observation is that sinus thrombosis is more often fatal when the necrosis has extended into the petrous portion of the temporal bone. With a deep necrosis in this region, other complications are more likely to occur.

Leucocytic count shows a high degree of leucocytosis, varying from 10,000 to 40,000. This condition might also be expected in acute abscess of the mastoid process, however, a high leucocytosis is indicative of greater extension of suppuration than in the mastoid alone. "The blood may show streptococcic or other infectious organisms."

A leucocytosis of 10,000 or more, following a few hours or days after operation and sustained for any length of time, is indicative. according to Emerson, of deeper complications.

At present, the question of most importance is, shall the jugular vein be ligated in all cases of sinus thrombosis?

Whiting (*Archives of Otology*, page 253, June, 1906.) "Considers that the inability to re-establish the circulation from the bulb was a positive indication of resection of the jugular, whether the clot contained at the bulb has undergone purulent disintegration or not; also, that the jugular should be resected in every instance when the clot in the sinus has undergone purulent disintegration."

John D. Richards (*Arch. of Otol.*, June, 1906, page 378.) says that primary jugular ligation or reaction is rarely indicated except in the presence of metastasis.

Kennon (*Arch. of Otol.*, June, 1906.) says, should a thrombus be situated either primarily or secondarily in the bulb, we should at once expose and resect the jugular vein.

Dench (*Journ. of Am. Med. Assn.*, October, 1906, page 1290.) says, "Sinus thrombosis recognized early, will be almost certainly cured." Dench further says (ibid), "In a case where the general condition of the patient is good, jugular exsection should be performed at the first operation if full hemorrhage does not take place from the bulbar end of the sinus."

Before resorting to the complete exsection of the jugular veins, it is well to consider first, whether or not we have any metastatic complications, as pneumonia, abscess in the lung, or septic endocarditis. With such complications, severe in character, there can be no good derived from a primary resection of the jugular vein. Even in a consideration of primary jugular exsection, there is the constant possibility of purulent phlebitis and infective embolic substance passing through the collateral circulation in the neck. In the present light, I should prefer to explore the sigmoid sinus and with the thorough establishment of circulation and absence of purulent phlebitis, plug the wound; finding the bulbar region involved with a retarded flow of blood from above or below and the patient strong, would recommend jugular resection, resecting the vein as completely as possible.

Newton Claypool Building.

A Trial of Inhalations of Phenylpropiolate of Sodium with Bulling's Apparatus. K. BUCHER. *Monat. f. Ohrneh.*, May 1906.

The author tried this treatment in 6 cases of tuberculous laryngitis, in which the usual dietetic and hygienic measures could not, for various reasons, be carried out. All the cases but one were favorably influenced, but the method cannot be generally employed on account of the excessive cost. YANKAUER.

PURULENT, HYPERPLASTIC AND ATROPHIC CATARRH, DIFFERENT STAGES OF ONE AND THE SAME DISEASE OR CONDITION.*

BY JOHN NORTH, A.M., M.D., TOLEDO, OHIO.

We are unfortunate in having to use the term *Catarrh* in connection with the diseases of the naso-pharyngeal passages. Catarrh simply means "to flow downward." It gives us no pathological basis of the disease or condition. Bosworth says that "a patient suffering from nasal catarrh really has some diseased condition of the upper air passages." But do we know what it is from a pathological standpoint? The term "rhinitis" is equally unfortunate, as in most forms of so-called rhinitis we do not have a true inflammation of the nasal mucous membrane. For the want of a better term, I have used the term *catarrh* to designate the three conditions under consideration, namely, purulent, hyperplastic and atrophic catarrh, which I firmly believe to be the three different stages of the same disease or condition. Did you ever see a case of true atrophic catarrh that you could not trace back to a case of purulent catarrh of childhood? I do not mean ozena. We can have ozena without atrophy. Ozena is only a symptom, not a disease. Atrophic catarrh is not so prevalent now as it was several years ago. Those that have been treating nasal diseases know that the proportion of true atrophic cases are much smaller than they were fifteen or twenty years ago. Don't you older practitioners remember that when you were boys, attending the country district school, that nearly every boy had a "snotty nose?" You see but few cases of it now. Not every case of purulent nasal catarrh of childhood resulted in atrophic catarrh, but every case of atrophic catarrh commenced as a purulent catarrh, passing on to hyperplastic catarrh (not hypertrophic), to the atrophic condition.

We will now follow the relationship of these three different diseases.

Purulent Nasal Catarrh. This disease is usually confined to childhood, but it may be acquired at any age. It is a true inflammation of the nasal mucous membrane caused by the introduction of some variety of pyogenic cocci into the nasal cavities. It is an infectious disease by direct infection of gonorrhoeal secretion or of some other pyogenic germ, sometimes in infants as a result of maternal leucorrhea. Sometimes it is a sequela of the exanthematous diseases. A number of years ago when that form of eye disease called "granulated lids," which was preceded by purulent opthalmia, prevailed, the disease was quite prevalent. I am not aware that the exact cause or pathological conditions in the eye disease was worked out. With the diminution of the eye trouble, purulent nasal catarrh became less and less, so that at the present time we come across but few cases of it. Some of our latest works on nose and throat diseases do not even mention it as a separate and distinct disease, but as one of the forms of acute nasal catarrh. Purulent nasal catarrh is an inflammatory disease, while acute nasal catarrh, or "cold in the head," is not an inflammation, but a vaso-motor disturbance which is relieved as soon as the vaso-motor system is controlled.

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* Read before the Eye, Ear, Nose and Throat Section Ohio State Medical Association, Cedar Point, Ohio, August 29th, 1907.

Purulent nasal catarrh does not always have the same symptoms, or have the same result or produce the same change in the mucous membrane. The symptoms, course and result depends upon the infectious germ producing it. Time does not allow me to go into the symptoms and cause of the various kinds of purulent nasal catarrh, so I will briefly give some of the results of the disease.

1st. With proper treatment instituted early in the disease, a favorable result takes place, the mucous membrane is restored to a healthy condition and the parts resume their normal functions.

2nd. Another class of cases continue for several years. They do not yield to treatment readily. The disease continues until ulceration and necrosis of tissue takes place, partial or complete destruction of membrane results, healing with large open nares covered with a dry shiny membrane. This is sometimes called atrophic catarrh, but it is not atrophy, but destruction of tissue. We have an ozena or dry catarrh, but differing very much from true atrophic catarrh.

3rd. If the nasal mucous membrane is not restored to a healthy condition, and destruction of tissue does not take place, the inflammatory condition produces an increase of intracellular or connective tissue. As the result of inflammation, we have a growth of new tissue surrounding the glandular structure of the nasal mucous membrane. This gives the appearance of enlargement of the parts, with narrowing of the lumen of the nasal cavities, and we have a case or the hyperplastic catarrh. The increase in the size of the tissue depends upon the growth of connective tissue and other products of inflammation. The normal elements of the membrane are not increased in number or in size. It is a true hyperplastic condition. This is frequently but incorrectly called hypertrophic catarrh. It is not an hypertrophy. In hypertrophy we have an increase in the normal cell structure of the part in the same proportion in which they existed before the hypertrophic condition took place. There is no increase of connective tissue.

True hypertrophy of the nasal mucous membrane seldom or never takes place except where we have a marked deviation of the septum, the side of the convexity being closed, or nearly closed, the side of the concavity being large, performs the nasal functions of both sides, having more work to do than in the normal condition, the nasal mucous membrane takes on growth and increases in size—here we have a true hypertrophy.

The term hypertrophic catarrh has very incorrectly been applied to every condition of the nares in which there has been an enlargement of the tissues lining the nasal cavities.

It is the history of every case of hyperplasia that, after the inflammatory process has subsided, contraction and absorption of the organized products of inflammation take place. By the contraction of the connective tissue, pressure is produced upon the glands, blood vessels and nerves of the nasal mucous membrane, and causes them to shrink by comparison and in time lose their function and the tissue becomes atrophied.

Atrophic Catarrh. When this condition takes place in the nasal mucous membrane we have true atrophic catarrh. In some portions of the membrane we have hyperplastic tissue and atrophic tissue existing at the same time. Atrophic catarrh never does and cannot take place as the result of hypertrophy. Intumescent catarrh never results in atrophic catarrh. A little more study of pathology of all the conditions classified under hypertrophic catarrh would show that atrophy can only result from hyperplasia.

Ozena, or dry catarrh, is a term given to a number of nasal diseases, yet it is only a symptom. The offensive odor of ozena may come from numerous causes. It may arise from syphilitic or scrofulous conditions of the nose. Sometimes the secretion is offensive itself, in other cases the fetor is caused by the decomposition of accumulated secretions. In cases of destruction of mucous membrane or from atrophy, the secretion dries upon the surface and keeps accumulating until quite a mass has been produced, decomposition takes place and the mass comes away with a very offensive odor. In some cases of so-called atrophic catarrh, the secretions from the accessory sinuses coming in contact with the membrane below give up their moisture to the inhaled air, and become dry and in time become very offensive and are expelled in large slugs. The case is called atrophic catarrh when there is no atrophy. If we take a case of sinus disease with considerable secretion and place a pledget of absorbent cotton above the tumescent bodies and let it remain in all night and remove it in the morning, we will find that the upper portion of the cotton is covered with dried secretion with the mucous membrane of the turbinates in a normal condition. These cases are spoken of as atrophic catarrh arising from sinus diseases. Atrophic catarrh is seldom or never the result of sinus diseases, notwithstanding the high authorities to the contrary upon the question. Every case of destruction or shrinkage of the nasal mucous membrane is not atrophic catarrh. Every case of offensive odor from the nasal cavities is not atrophic catarrh. Every case of removal of dried secretion (slugs) from the nasal cavities, with or without odor, is not atrophic catarrh.

515 Madison Avenue.

Adenoid Hypertrophy and Adenotomy. DR. V. DE CIGNE, DE GENES. *Rev.Heb. de laryng. d'otol. et de rhinol.*, March 1907.

Of the total number of patients treated during two years at the Saint-Andre's Hospital 14.56 per cent. suffered from adenoids. From the standpoint of age, it was between three and five years, and, later, between 12 and 15 years that this affection was found most frequently. The explanation of this, according to the author, is as follows:

During the first period, between three and five years, the child is left for the first time by its nurse or mother to remain out of doors and play with children of its own age. It is at this time that the air affects the young adenoidian, and, the child not knowing how to blow its nose, the muco-purulent secretions are retained in the nasal cavities and develop complications which result in the child being brought to the hospital.

In the second period, from 12 to 15 years, the adenoidic disturbances appear at the time of the sexual evolution which has its effect upon the mucous membrane of the nose and naso-pharynx. In the girl, these disturbances are more marked at the periods of menstruation.

SCHEPPEGRELL.

A SUBMUCOUS OPERATION FOR THE REDUCTION OF HYPERTROPHIED TURBINALS.*

BY C. P. LINHART, M. D., COLUMBUS, OHIO.

One of the perplexing questions that confronts the rhinologist is the best method of treating hypertrophied tissue of the turbinals. There are many remedies for this condition, but no one is entirely satisfactory for all cases. The various surgical procedures for shrinking the hypertrophied condition, chemical caustics, actual cautery, incisions and sections, have one serious defect. Each leaves an open wound, which heals by the slow process of granulation. After the cutting operation, even when the nose is packed, hemorrhage from the dilated veins is sometimes severe. The removal of blood clots and crusts is a cause of frequent oozing, which may continue during the entire course of healing. While the infection through the open wound is rarely severe enough to produce any constitutional disturbance, it does cause increased secretion and delays the healing process. If a large portion of the turbinal is removed, the loss of function is a source of permanent annoyance. The resulting scar tissue interferes with the physiological function of the nose in proportion to the amount of mucous membrane destroyed. Moreover in a narrow naris, particularly where there is a projecting spur, there is danger of synechia forming between the turbinal and the septum.

On section of the inferior turbinal, the anterior part shows an abundance of glands, while the posterior area is composed for the most part of cavernous or erectile tissue with very few glands. In detail this region presents a series of erectile vascular channels more or less filled with blood, which occupy the greater part of the section between the surface epithelium and the periosteum. Their walls consist of white fibers, with fine nucleated tissue corpuscles, and a few erectile fibers with numerous muscle fibers which run in all directions and form interlacing bundles between adjacent spaces. (Lennox Browne.)

In simple chronic or intumescent rhinitis, the mucous membrane and erectile tissue are relaxed, flabby, readily distended by blood, allowing the turbinal to rest against the septum, causing more or less complete occlusion of the nose. The history of these cases shows that the occlusion alternates from side to side. When one side is open, there is nearly always complete or partial occlusion of the other side. When in the recumbent position, the patient lying on the side, by force of gravity the turbinal of the under side is occluded. There is a sense of stuffiness, the insufficient passage of air through the nostril encouraging mouth breathing, and mouth breathing is one of the most frequent causes of pharyngitis and laryngitis. The turbinate bodies are organs with a definite physiological function to perform, and the condition of the lower respiratory tract depends upon their usefulness and integrity.

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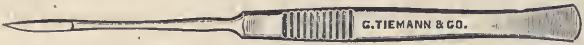
*Read before the Canadian Medical Association, Montreal, Sept., 1907.

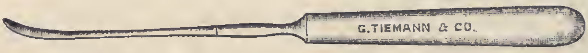
When the physician is consulted for diseases of the nasopharynx, larynx and ear, he should first of all examine the nose to see if the anterior respiratory passages are free before attacking the conditions further back. It is a fact beyond question that a narrow nasal breathing space is contributory to, and often an exciting cause, of the various neuroses and inflammatory conditions of the respiratory tract. The neurotic conditions, sneezing, spasmodic cough, hay fever and asthma, are benefited by an improvement in the hygiene of the nose. The treatment of inflammatory conditions such as pharyngitis, laryngitis, bronchitis and middle ear catarrhs, is a waste of the physician's time and the patient's money, without removing the exciting cause and improving the breathing space in the nose.

Turbinectomy either by scissors or snare, is an easy operation, but seldom justifiable because it destroys large mucous surfaces that can not be replaced, is liable to be followed by severe hemorrhage, which in the experience of some operators has occasionally proved difficult to control, and leaves a sensitive scar tissue which is unable to perform any physiological function. True, it makes an opening through the nose, and if the operation is on the inferior turbinal, the breathing space is along the floor of the nose and the operation does not shrink the middle and often most redundant portion of the turbinate body so as to keep it from coming in contact with the septum. The upper part of the inferior turbinal remains just as flabby as ever, and more or less completely occludes the middle part of the nose. The hole may be made large enough to permit nasal breathing, but the inspired air will not receive the amount of moisture and heat it would get were it to pass over the entire surface of the turbinal. While the patient may be better able to breathe through his nose, the conditions for which the operation is performed are not benefited. Cutting a wedge-shaped groove along the turbinate body over the site of greatest redundance, would be a better operation, but it is difficult to perform, liable to be attended by annoying hemorrhage, and would only appeal to an expert rhinologist. Cauterizing by means of various acids is used by many operators. Unless used with the utmost care it destroys too much mucous membrane in making the scar deep enough to cause appreciable shrinkage of the erectile tissue. The electric cautery appeals to me as being more efficient and causing less damage to the secreting surfaces, and for several years it had been my practice to use it in nearly all cases of intumescent rhinitis. The main objection to the latter two methods is that the scar tissue stretches out after a time, in from five to seven years, and the operation has to be repeated.

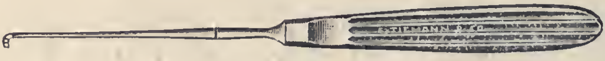
Kyle mentions an operation to reduce the tissue without leaving a surface scar. He scrapes the turbinate bone by means of a sharp pointed probe, making a simple puncture, passing the probe directly through the membrane to the periosteum, and by gently scraping the tissue sets up sufficient inflammatory action to produce a contraction. Delavan quoted by Knight, reports permanent results by submucous puncture.



Scalpel.



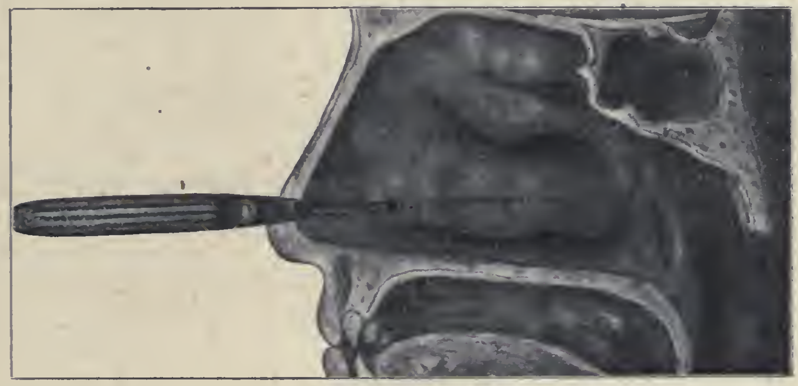
Dissector.



Hatchetknife.

For my recent operations, I have devised a long, slender, dull-pointed dissector, with a slight curve at the end that it may follow the contour of the turbinal bone, which is used to dissect a passage way along the bone preparatory to the introduction of the hatchet-knife. The latter instrument has a short blade at right angles to the shank, with a dull cutting edge facing the handle, so that the knife is introduced to the extremity of the opening made by the dissector, and is made to cut by drawing across the long axis of the turbinal from the rear to front. There is a circular mark on the shank of the dissector and on the hatchet-knife, two and a half inches from the tip, so that in the average nose when the point of the instrument reaches the posterior end of the inferior turbinal, the mark will be at the tip of the nose. This, however, is only an approximate guide as the length of the turbinal varies in different individuals, as does the distance of the posterior nares from the tip of the nose. In making the initial incision for the introduction of the dissector, a tenotome with a long slender shank is used. Any small scalpel would do for this purpose. Tiemann & Company suggested the above mentioned tenotome, and I find it quite convenient, particularly where an incision is to be made well back in the nose. The small knife with the long slender shank permits of a good view of the parts.

In detail the operation is as follows: The nose is made as aseptic as possible by some suitable alkaline wash, such as Seiler's solution. The mucous membrane for three-eighths of an inch over the site of the proposed submucous incision is thoroughly cocainized across the long axis of the turbinal. For this purpose a pledget of cotton soaked in a two per cent. solution of cocaine is applied. This is allowed to remain for five minutes, after which a twenty per cent. solution of cocaine is rubbed into the turbinal with a cotton tipped probe, three or four times at intervals of two minutes, or until the parts are thoroughly anesthetized. Before making an incision, the site of the proposed operation is again gently bathed with an alkaline solution by means of a tuft of cotton on an applicator.



Hatchetknife in position for making downward cut from rear to front of right turbinal.

A perpendicular cut one-fourth inch in length is made through the mucous membrane, just anterior to the hypertrophied portion of the turbinal. The slender dissector is then introduced and passed straight back close to the periosteum, in the long axis of the bone to its posterior extremity. On account of the uneven surface of the outer border of the turbinate bones, particularly of the inferior, it is often necessary to use considerable force and some manipulation of the handle of the instrument up and down and from side to side, so that the point of the dissector may pass over the little bony protuberances, in its passage back. In some cases where there is only slight intumescence, the scraping of the periosteum and gentle breaking down of some of the erectile tissue with the dissector will be sufficient. Where there is considerable distention of the venous sinuses it is necessary to cut through their walls and break them down in order that sufficient inflammatory action may produce the necessary adhesions for the desired shrinkage. For this purpose the hatchet-knife is introduced with the blade flat against the periosteum of the turbinal, back as far as it is desired to cut. The knife is then rotated so that the blade will reach out toward the greatest prominence of the flabby turbinal. If the redundant tissue is hanging down on the floor of the nose as well as projecting against the septum, it may be necessary to make a downward as well as an inward cut. The knife is then turned out toward the bone and the periosteum torn from the rear to front. The edge of the hatchet-knife faces the handle and the knife is always drawn toward you when making a cut; this avoids the danger of making a puncture or tear as could easily be done by a pushing movement. After withdrawal of the knife a tight-fitting nasal splint is introduced to hold the cut surfaces as tightly as possible against the torn periosteum. It is kept in place for forty-eight hours, after which time sufficient adhesions will have formed to bind the redundant tissue closer to the bone.

Sometimes there is a slight hemorrhage from the initial incision or an accidental tear in using the hatchet-knife, which can usually be controlled by an application of adrenalin, and the pressure of the splint. In fact, after completing the submucous incision I always make an application of adrenalin to shrink the erectile tissue of the turbinal, and this allows a tighter fitting splint to be introduced. The operation itself is best done without the use of adrenalin as this drug shrinks the venous sinues and erectile tissue too much to allow free play of the knife. To avoid tearing the mucous membrane, the hatchet-knife should be introduced with the point close to the periosteum so as to avoid the danger of pushing it through the turbinal just beyond its greatest convexity, into the cavity of the nose. When drawn forward in this position with cutting edge toward the turbinal, the knife will make an ugly tear in the mucous membrane, cause a severe hemorrhage, necessitate packing the nose, making an open wound that will have to heal by granulation.

This operation does not destroy any of the functionating membrane of the turbinal, shrinks the erectile tissue as well as could be done with a chemical escharotic or electric cautery, leaves no extensive external scar, and is as near aseptic as an operation can be in the nose. The breaking down of the walls of the venous sinuses and the binding of them together by pressure, make a shrinkage of the turbinal which ought to be permanent. If the mucous membrane over the site of the proposed submucous incision is thoroughly cocainized there is no pain and only slight shock from a disturbance of the nerve plexuses of the turbinal.

The operation is intended particularly for those cases of simple intumescence, with vaso-motor paresis of the walls of the blood vessels composing the erectile tissue, when the turbinal has become flabby from repeated attacks of rhinitis. The transition from simple intumescent rhinitis, with relaxed blood vessels and mucous membrane, to that of hypertrophic rhinitis, with newly formed connective tissue, is so gradual that there is no distinct dividing line between the two conditions. Very good results follow the operation on turbinals in which the tissue has been made dense and thickened by repeated inflammatory attacks. In making the first operations by this method I did not use the splints to hold the cut surfaces close to the bone, and often failed to get sufficient shrinkage, especially when there was considerable intumescence; but since using the splint I have gotten much better results. In one case both inferior turbinals were operated upon, and the splint was introduced only on the side of the greatest intumescence, and the result showed a greater improvement on that side. Tests with different sized tubes, showed that a tight fiting tube introduced after shrinking the turbinal with adrenalin, produced greater and more permanent shrinkage of the turbinal than a loose fitting splint.

There are a great many cases of a slight swelling of the turbinal, blocking the nose considerably, accompanied by profuse secretion from the membrane, which cause considerable annoyance to patients. It had formerly been my practice to apply some stimulating medication to the parts in an effort to bring about a normal condition. There was often considerable improvement, particularly for a time, but sooner or later there would be a return of all of the original trouble, and I find in these cases particularly, that this simple operation has proved of great benefit.

The chief points of advantage of this operation are: It shrinks the vascular tissue of the turbinals, allowing free respiration of air through the nose; cutting across the walls of the venous sinuses causes their obliteration, and permanent shrinkage results from the inflammatory adhesions; the base of the scar is on the turbinate bone, the seat of greatest traction; the operation being submucous there is less danger of troublesome hemorrhage and infection; there is no destruction of the mucous membrane, and consequently no open wound to heal by granulation; it requires but a short time for surgical treatment (two days), and causes least interference with the physiological function of the nose.

106 E. Broad St.

The Efficacy of Adrenalin Chloride in Some Forms of Suppurative Otitis. DR. SUNE Y MOLIST. *Rev. heb. de laryng. d'otol. et de rhinologie.* Feb. 23, 1907.

According to the author, the use of adrenalin is indicated in the following cases: Fungosities of the canal and of the handle of the malleus; granulations of Schrapnell's membrane and fungosities of the drum with small perforation; otorrhoea from passive congestion of the promontory. He especially recommends the use of adrenalin for patients who refuse surgical intervention.

The technique consists in instilling eight drops of the solution into the affected ear, the head being bent to the opposite side, holding it in this position for five minutes, the canal being closed with a piece of carbolated cotton. This application should be repeated every hour of the first day, every two hours the second day, and afterwards according to the affects obtained. If no benefit is obtained at the end of a fortnight, the treatment should be abandoned for surgical methods. SCHEPPEGRELL.

Neuralgia of the Throat. GEORGE BOENNINGHAUS. *Deutsch. med. Wchnsbhr.*, Leipzig. Nov. 10, 1904.

The patients complain of salivation, empty swallowing, pain and parasthesia of the larynx. There are characteristic points of tenderness at the point of entrance of the superior and inferior laryngeal nerves into the larynx. YANKAUER.

VASELINE OIL IN THE DRESSING OF THE RADICAL MASTOID OPERATION.*

BY J. N. ROY, M.D., MONTREAL, CANADA.

For some years past, the dressing of the mastoid operation has been done in several different ways. In 1902, Eeman of Gand, in his first communication to the Belgian Oto-rhino-laryngological Society, extolled the use of boracic acid. In the following year, he returned to the same theme, and reported statistics of 38 patients treated by his method.

In 1905, Mahu of Paris, presented before the French Oto-rhino-laryngological Society a new procedure which consisted, not in packing the wound, but only in draining it by a strip of gauze placed upon the floor of the canal.

It is not my intention here to discuss the opinion of Laurens which, in certain cases, would make the dressing of the radical operation identical with that of trephining in simple mastoiditis. This would be going too far outside my subject, inasmuch as in the present communication I desire to speak only concerning epidermization and not concerning the filling up of the wound after operation.

All these different procedures are merely modifications of the classical German method which consists in bringing about the epidermization of the cavity by means of gauze packing.

During the month of June, 1905, it fell to my lot to perform the radical mastoid operation; and in spite of all possible care in the dressing, healing was long delayed. After having used without success all known procedures I fell upon the idea of making an entire change of method, and of replacing dry dressings by oily ones. The wound which I had been treating for more than six months was healed in ten days. Later I had, together with certain confrères, the opportunity of experimenting further with these oily dressings, and with no less success. In consideration of these facts, I feel justified now in laying down the following rules for this new method of dressing.

Radical operation is done as usual; but the surgeon should choose by preference an autoplastic procedure which will allow him to sew together the lips of the wound behind the ear; and especially so if he has not to do with a cholesteatoma. For complete haemostasis the post-operative dressing should be slightly compressive; and iodoform gauze should be used. About the sixth day the gauze is taken out, and the wound is carefully cleansed with hydrogen peroxide; then dried with cotton. Little strips of plain gauze about one and a half centimeters wide and six centimeters long are dipped in vaseline oil, one end is introduced into the drum either by the canal or by the retro-auricular opening, and the other end remains outside the wound. The whole cavity must be carefully carpeted with this gauze, and the strips should overlap each other slightly. Upon this first layer, cotton is applied sufficiently saturated with liquid vaseline to be well packed in. In doing this packing, which must be fairly tight, it is necessary not to leave any dead spaces, so that to this end it is better to use little pledgets of cotton. A great deal of care must be given to the external meatus and to the operative opening of the canal. It must be packed rather tightly, on the one hand to prevent any subsequent narrowing, and on the other hand to maintain the apposition of the flap. When the cavity is well filled, the dressing is finished with dry cotton and a bandage. It is scarcely necessary to add that the vaseline, the oil, and the cotton should be sterilized, and that the surgeon should conform to the most careful asepsis. At first, the dressings must be done every day, but when the secretion of the wound lessens and epidermisation is going on normally they may be done every second day. The dressing should be removed very slowly. Inasmuch as the strips of gauze sometimes stick to the skin, it is better to take them out by pulling from outsides inwards, after having moistened them with oil or with peroxide. Subsequently, the wound is cleansed with peroxide, carefully dried, and before replacing the dressing in the manner described, care must be taken to see that no stray ends of gauze are left. In the presence of any possible complication one must act according to circumstances. The technique of the method, as may be seen, is easy.

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*Read before the Columbus Academy of Medicine, Sept. 16. 1907.

Case Reports.—In March, 1905, Mr. M. 23 years of age, consulted me at the Hôtel-Dieu for a discharge from the left ear which had lasted two months. Upon examination I found a perforation of Shrapnell's membrane and a polyp taking origin in the attic. The removal of the latter was immediately done. In spite of this, the discharge continued and the polyp recurred, even after a second operation. In April, I decided to perform removal of the ossicles with thorough curetting of the attic. The hammer and the incus were removed and the post-operative course was normal; nevertheless, the ear continued to discharge and the polyp again recurred. Towards the end of May, patient became a little feverish following a slight attack of mastoiditis. Evidently, there was still retention; the treatment was giving no result, and symptoms were increasing. In June, I performed the radical operation. The antrum, the aditus, and the attic were found to be filled with granulations, due to the osteitis. Panse's autoplastic method was employed; the dressing was done daily, plain gauze being used with compression. At the end of four months, the cavity had skinned over with the exception of one recess in the floor of the drum which during the succeeding month refused to heal. I then changed the dressing to boracic acid, and in spite of the small amount of powder insufflated retention occurred, and the patient grew worse. I then contented myself with cleaning the wound and leaving it to nature. A small crust formed and the cavity suppurated. Being confronted with a total lack of success from these three methods used over a considerable period of time, there occurred to me the idea of using vaseline oil in the dressings, a method which brought about definite cure inside of ten days, a cure which has been maintained from that time to this.

The two following observations I owe to the kindness of my friend Dr. Lasalle, to whom I had communicated this method and who was so kind as to try it.

Sister L., thirty-two years of age, suffering from a double acute suppurating otitis media, influenzal in origin, lasting since January, 1905. In March, double mastoiditis which on the left side got well. On the right side trephining was done in April. Patient was scrofulous and the tissues in poor condition, so that the wound kept on granulating. Tonics were given internally. In April, the cavity was still not filled up, the osteitis was persisting and the radical operation was done, using Stacke's autoplastic method. The wound was dressed with clean gauze under compression. In the latter course it had to be cauterized and scraped repeatedly on account of recurring granulations and slow epidermization; and in spite of tight dressings the cavity tended to close. The peritubal cells were causing osteitis, so that in December, 1905, a complete curetting was done; the former dressings were again employed but alternating later with those of other methods. One year later there still remained one third of the wound to become covered with epidermis. Finally, dressings with vaseline oil were tried and definitely cured the patient.

Mrs. P., 36 years old, had suffered with a discharge from the right ear since her childhood. Following a coryza she had an attack of mastoiditis in December, 1906, and a sub-periosteal abscess. On the 22nd of December the radical operation was done. There was no cholesteatoma, but there was destruction of a large portion of the periantral cells and of the posterior bony canal. The dura mater and the lateral sinus were laid bare by the osteitis. The ossicles had disappeared as the result of the suppuration. The Stacke autoplastic operation was done, followed by packing with iodoform gauze. On the sixth day, the first dressing with liquid vaseline was done. By the commencement of January the cavity was beginning to skin over. On the 31st of January the epidermis had covered three-quarters (3-4) of the wound. With the compressive dressings with vaseline oil, all narrowing of the cavity had been prevented, the patient suffered no pain; the wound did not over-granulate, and never suppurated. By the 14th of February, the patient was completely cured, that is, after 54 days of dressings.

Discussion.—If now we take a rapid survey of the advantages and the disadvantages of these various procedures we shall see that:

The classical German method which consisted in gauze packing is very painful; moreover, it is impossible to fill up completely the operative cavity, and especially the drum. Inasmuch as these dressings irritate the tissues there are formed granulations which necessitate repeated scrapings and cauterization. Add to this the fact that treatment must extend over several months.

Upon the admission of Mahu himself, the procedure which consists in letting nature have her way and in simply draining the cavity, is applicable only when there is present simply osteitis. The operative cavity not being lightly packed, naturally the walls fall in, and this may occasion serious complications. Moreover, there is formed an excess of granulations which retard epidermization.

As to the method of Eeman, which seems to be most in favor with otologists, the same objection must be made to it as to the preceding method. In the absence of tamponning, the cavity has a tendency to close over, and the recurrence of a cholesteatoma might even render necessary a second operation. Boracic acid more or less dissolved by the secretions of the wound forms an irritating paste and promotes excessive granulations. Finally the pain of the dressings during the first three weeks has been alone sufficient to prevent many surgeons from continuing to use it.

With vaseline oil, the surgeon is able according to his wish to allow the wound to close in by merely packing more or less tightly; or on the other hand, to preserve the shape of the cavity such as it was immediately after operation. The granulations in contact with this aseptic fatty body are perfectly protected against all infection, and have no tendency to grow exuberantly or to suppurate. The epidermis formed is solid and extends quickly over the well prepared osteo-fibrous bed. No pain is felt at any time during the dressings. The patient whose history was last related was cured in fifty-four days. It would be easy now to secure complete healing in much less time by suturing the margins of the retro-auricular wound immediately after operation. I do not wish to discuss the value of Thiersch's skin grafts; yet the partisans of this method will find in vaseline oil after drying and freshening the wound one of the best methods of dressing for this small operation.

Among all the oily substances, I have concluded that liquid vaseline was to be used in preference to vegetable oils. We can get the same results, according to my experience, with other oils; for example, olive oil, and sweet almond oil. Still, we know that these are often adulterated, and rapidly become rancid by a fermentation which changes them partly into oleic acid or other analogous acids; and they may thus become very irritating to the tissues with which they come in contact. Moreover, the least lack of asepsis is capable of making of them an excellent culture medium.

On the other hand, liquid vaseline has none of these disadvantages. It is a neutral mineral oil, and it does not change either with light or in the air; consequently, it does not become rancid. It is very stable, and can resist the action of the most energetic chemical substances; moreover, it cannot be infected. For these reasons, it is to be preferred to all other oils for this kind of dressings.

The small number of patients treated hitherto by this new procedure does not allow me to deduce fixed conclusions. The aim of this communication is rather to submit this method to my confrères, and to suggest that they should try it and later communicate the result of their personal experience.

In concluding, I would remark that with vaseline oil dressings:

1st. There is no pain.

2nd. The wound does not granulate.

3rd. Epidermization proceeds rapidly.

4th. The cavity retains, if so desired, the shape which it had immediately after operation.

379 Rue St. Denis.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, December 18, 1907.

THOMAS J. HARRIS, M.D., Chairman.

PRESENTATION OF CASES.

A Case of Harelip Operated by a New Method. By WM. W. CARTER, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

A Case of Infiltration of the Larynx, Probably Syphilitic. By J. E. NEWCOMB, M. D.

The patient first came under observation a few months ago, at the Out-Patient Department of the Roosevelt Hospital. He is 36 years of age, family and personal history negative. No specific history. He is a gardener and furnace man and has been able to continue his work right along with the exception of a short time in the spring. His eyes have been somewhat prominent ever since he was an infant. Up to about nine or ten years ago he was in perfect health, but then his larynx box became somewhat prominent and he experienced a little trouble in breathing, though not until two years ago did he have any real dyspnoea. Since then he has had considerable difficulty in breathing and was referred to the hospital by Dr. Deming. No satisfactory explanation has been discovered for the condition present. For lack of more definite knowledge, he was put upon iodid. After that, his dyspnoea increased, and he was admitted to the hospital as it was thought that a tracheotomy might be necessary. The urgency of his symptoms passed off, however, and he was able to resume attendance at the Out-Patient Department. He has not been taking much iodid, but his difficulty in breathing seems to have lessened under that treatment. There is a general infiltration of the larynx. The left side moves slightly, and the right side not at all. On the median aspect of the arytenoid there is loose flabby tissue which flaps back and forth in an irregular way.

Dr. Newcomb said that he presented the case with the hope of getting some suggestions as to further therapeutic treatment. Thus far the case had been treated on the presumption that it was syphilitic, but there was no more definite reason for this than the argument of exclusion.

DISCUSSION.

Dr. Simpson said that it seemed to him, notwithstanding some of its peculiar features, that the case might not be specific. The element of time must of course be taken into consideration. It was evidently a very slow, indolent tpye of infiltration, but hardly seemed to be anything else. The cartilage was not involved. The peculiar annular shape has included some of the anterior portion of the larynx. It seemed to be an ideal case for the dilation treatment, by intubation, beginning with the small tubes and increasing them. The tissue is too dense to be incised before using the tube. He also suggested the injection of bichloride.

Dr. Pooley said that the patient showed marked symptoms of exophthalmic goitre. The slow descent of the eyelids when the eye looked downward, together with the enlargement of the thyroid gave distinct evidence of that disease, though he would not undertake at the moment to say whether this had any bearing upon the laryngeal condition.

Dr. Newcomb replied that the possibility of the case being one of exophthalmic goitre had not been overlooked, but it had to be remembered that the exophthalmos dated back to the patient's infancy. He stated that he and his colleagues had not been able to assure themselves that there was any enlargement of the thyroid, and the patient had not the characteristic pulse of Graves' disease. He had not taken large doses of iodid, and the therapeusis had been limited by the fact that he lived at a long distance. He had been taken into the wards for a short time for purposes of observation, and the trouble passed off and he had been able to resume his work of gardening until the last few weeks, when he took a severe cold. He would try treating him with injections of bichloride or salicylate of mercury.

Hyperplasia of the Larynx. By J. W. Gleitsmann, M. D.

Dr. Gleitsmann said that he had brought the patient on account of the diagnosis and with the hope of obtaining some suggestions as to the best method of treatment. Two weeks ago, he first came to the office for treatment. The diagnosis of the laryngeal affection was made, and operation advised, and to-day he was admitted to the hospital. The sputum had not yet been examined, but the patient had no temperature, and according to the report of his former physician, no pulmonary affection. Two weeks ago there was a slight dullness in front of the sternum on the right side, and on the middle lobe dullness and exaggerated breathing.

Two weeks ago the patient was told that an operation should be performed without much delay, as he had been suffering for a year, and began now to have dyspnoea. Three or four weeks before he came under observation he complained of difficulty in swallowing.

Inspection of the larynx shows an infiltration of both ventricular bands; the vocal cords are visible on forced deep inspiration, and are not affected by the infiltration. Their epithelium has been shed off at the edge. An extended infiltration of both arytenoids and at the posterior wall is easily seen. The most peculiar and interesting feature of the case is that though the infiltration of the larynx is very extensive the cords approximate, but complete aphonia exists, which may be due to an extension of the infiltration of the posterior wall below the cords.

Dr. Gleitsmann said that he had considered the case very carefully during the two weeks that the patient had been at home, and it seemed inadvisable to attempt to remove the arytenoid. There would be no difficulty in removing the ventricular bands. Such cases occur very frequently, and they can be removed, but he would not like to operate intralaryngeally on account of the uncertainty of the condition of the subglottic space. His choice would be to perform at least a thyrotomy. If this was decided upon, he could perform preliminary tracheotomy and the thyrotomy at the same time.

He would like to know the opinion of the members present as to whether, if the infiltration of the posterior laryngeal wall goes down sufficiently deep, there would be any prospect of removing it.

DISCUSSION.

Dr. Freudenthal said that he had seen many similar pictures of the larynx, but was not at the moment prepared to say whether or not the present case was tuberculous. Dr. Gleitsman, however, had examined the patient thoroughly and believed the lesion to be tubercular. He had removed similar granulations of the posterior wall, not with a view of curing the case, but simply to relieve the dyspnoea, when tracheotomy was not allowed. He thought, however, that the future treatment of such cases would be the thorough removal of the larynx and affected parts. Of course, this would probably result in a large death rate, but this would be better than the inevitable and indefinite suffering.

Dr. Coburn suggested that the matter of diagnosis would be simplified by the injection of tuberculin, or the application to the eye of tuberculin for the ophthalmo-tuberculin reaction of Calmette. One would then know positively whether he was dealing with a new growth or a tubercular one.

DR. BEAMAN DOUGLASS said that clinically the case seemed to be one of proliferative tuberculosis of the larynx. The tendency is to operate intra-laryngeally and give as much relief as possible, and failing in that to do a thyrotomy. He had failed in thyrotomy operations in tuberculous cases last year. After splitting the larynx and removing the growth, the patient died of the asthenia or of an extension of the tuberculosis in the lung or in the larynx.

DR. HARRIS inquired whether Dr. Gleitsmann had considered the procedure of a pure tracheotomy without attempting to remove the larynx. This has been done, with favorable results.

DR. GLEITSMANN, closing, responded that he had brought the case before the section first to consider the diagnosis. In his opinion, that was established. The examination of the sputum would be made the next day, and his views in regard to the condition of the lungs would be confirmed or negatived.

In regard to the diagnosis made by tuberculin in the eye, it is a comparatively new feature. An excellent paper has recently been written by Dr. Baldwin, but he himself had had no experience in that line. He had no doubt that it is a safe and correct method, but on the other hand there is no doubt that the diagnosis can be absolutely and correctly established by the ordinary measures employed.

In his opinion, the appearance of the larynx indicates tuberculosis of a slow type, which approaches the tuberculomata, and which can exist for a year or more before breaking down. It was probable that this patient could go on for a little while longer without the infiltration breaking down although recently he had noted a slight change in this respect. Two weeks ago the larynx was clean and free from discharge, but at present there is a slight discharge; and shedding off of the epithelium in some places.

Some time ago he had presented a similar case before the Section, which no doubt many of those present would remember. It was a true hyperplasia, and had been so declared by several others beside himself. Pieces of the infiltration were examined by different pathologists who pronounced it to be undoubtedly hyperplasia. A preliminary tracheotomy was performed, followed by a laryngotomy, and the growth was excised thoroughly, Dr. Delavan kindly consenting to be present. The patient made a good recovery, is perfectly well now, but speaks with a slight degree of hoarseness as the thyroid plates do not come together laterally, one overriding the other a little.

He had done some endolaryngeal work along this line and was very well satisfied with the results obtained. He would not hesitate to make an attempt at endolaryngeal removal, but it would be impossible to remove sufficient of the infiltration, which he considers to be tubercular, to reach healthy tissues. At least three operations would be required to remove this enormous infiltration and he was inclined to operate externally, but the exact procedure has not yet been determined. A tracheotomy alone would be only a palliative measure. He would live longer, if the tuberculoma did not progress too quickly, but he had not at all considered the question of a tracheotomy alone. He wished to emphasize the fact that the closure of the glottis does not indicate a paralysis. Both cords move slightly, and the movements are symmetrical. The infiltration of the posterior wall of the larynx is very great, but there is danger of its going downward, extending to the subglottic space. He had operated on a similar case before, and had excised the infiltration in a girl who did very well at first, but a recurrence took place. A laryngotomy was then performed, and the girl died finally of exhaustion.

A Case of Tumor of the Pharynx. By D. B. Delavan, M. D.

DISCUSSION.

Dr. Ingals showed a pair of forceps which he had had made for use in just such cases. The first instrument was not quite right, of course, but after two or three trials a very satisfactory one was secured. The design is to introduce it into the naso-pharynx where it fits the posterior wall. It is then clamped onto the tumor and locked. The blades of the forceps are covered with ivory so that they are insulated, and the loop of the galvano-cautery draws up over them and cuts off the tumor, the ivory preventing a short circuit. The instrument had been used in several cases and works very satisfactorily.

Radiographs Illustrating the Normal Topography of the Pneumatic Sinuses of the Face. (With Description.) By Sinclair Tousey, M. D.

To be published in full in a subsequent issue of The Laryngoscope..

Intra Nasal Drainage of the Frontal Sinus. By E. Fletcher Ingals, M. D., Chicago.

DISCUSSION.

Dr. Myles said that he had struggled with this subject for twenty years and that he feels much indebted to Dr. Ingals for the presentation of his method and his experiments, for any work in an original field like this must be more or less experimental. For a long time Dr. Myles advocated the open external route, but his observations, corroborated by those of others, have led him to believe that if a large opening could be made by the internal route the pathological conditions would do much better, in the average case. These conditions inside the sinus are more or less temporary, and with ventilation and free drainage the parts will become more normal. This has been demonstrated in the antrum of Highmore, in the sphenoidal cells, and in the large air cells (mastoid and ethmoid)—so the question has naturally arisen, why not do the same thing for the frontal sinuses? In ten per cent of the frontal sinus cases the radical operation may be necessary. He has had some instruments made very similar to those of Dr. Ingals, but has never succeeded in introducing them as Dr. Ingals has done, and has never been able to get them to work satisfactorily. He abandoned the procedure of drilling but continued to work along the same line, although a little differently. He now removes the middle turbinate, and the floors of the ethmoidal labyrinth, and uses the medial wall of the ethmoid as a shelf to prevent the closure of the aperture leading into the frontal sinus. If one studies these specimens carefully one can see that if large openings were made into the sinuses, nearly all of these cavities would drain well and have an opportunity to become normal again. The operation which has secured his best results has been the removal of the floor of the anterior and middle cells and intercellular walls, and then cutting away the nasal process of the superior maxillary bone. One of the best instruments for this work is the chisel that cuts outward. Most of these chisels are too elastic in the shafts and are not hard and small enough at the cutting edge. Then he has found the different forceps which he has presented to this Section very serviceable. He has not used the drill very much, for he found that after the use of the drill the aperture was completely denuded of the mucosa on all sides, and a law of nature is that contraction after drilling through a duct takes place in a circular fashion and frequently obliterates the duct.

Dr. Beaman Douglas said that admitting at the outset that the intra-nasal operation is the most desirable one, providing we can have a safe one, at present his views on the subject are radically different from those presented by Dr. Ingals. It was impossible to do justice to the other side of the question in the short time permitted by the lateness of the hour, so he would not present the negative side at all, but would simply say that if he had a frontal sinus disease, even knowing what he does of Dr. Ingals' skill and luck, he certainly would not submit to an operation by this intranasal method.

Dr. Christian R. Holmes agreed with Dr. Douglass that one could scarcely present the opposite side of the question in two or three minutes, and it was hardly worth while to try, but he would like to call attention to certain specimens which he had with him. He knew that Dr. Ingals had had some cases that were at least temporarily relieved but only time could tell whether there has been a cure or only relief of pain on account of drainage, and even that may be temporary.

In order to study the subject carefully and thoroughly, one should take sections which show the whole relation of the duct to the various parts and to the cribriform plate. For this reason he had brought these specimens, which he would like the members to observe. He has studied this subject for many years, and when one looks upon such specimens and notices the paper-like thinness of the bony walls it is evident that in the majority of cases it would be impossible to make an opening without causing the drill to impinge upon the dura. The drill may not open the dura, but he would certainly object very much to having his own dura treated in that manner, even in Dr. Ingals' skilled hands. He wished, however, to express his objection to anyone adopting this operation until he has become exceedingly skilful. He feared that many young men who have not given much study to nasal anatomy, would be mislead by Dr. Ingals' optimistic statement to think that a very easy and safe operation, which would be bound to lead to serious consequences. He is not prepared to say that a certain number of cases can not be operated upon by this method, but after dissecting several hundreds of specimens, he could not believe that it would be safe to do this, excepting in a small percentage of cases.

Dr. Coakley was prevented from attending the meeting, but sent the following expression of his views on the subject.

"The very ingenious method of draining the frontal sinus presented to us to-night was first described very minutely by the reader of the paper at the meeting of the American Laryngological, Rhinological, and Otological Society in Boston, in the early part of June, 1905.

"In discussing the paper at that time, I pointed out the possible danger of accidental perforation of the brain, and promised Dr. Ingals that I would give his method a trial. The more I considered the subject, however, the less favorably did it impress me, and I have felt that I could not safely carry out my promise. I believe the method to be exceedingly dangerous for the patient, difficult to perform, and, reasoning from analogy, cannot see how any more can be gained by this method of treatment than from others which are more simple.

"No one can study the conformity of the naso-frontal duct without realizing the danger of perforating the cavity by any trephine, even when guided by a director. I should never be willing to allow even so skillful an operator as Dr. Ingals to attempt this procedure on me; I would very much prefer an external operation.

"The principle of tube drainage was thoroughly tried for many years in diseases of the maxillary sinuses. Unquestionably a great many cases were cured, but many of them were not, as is evidenced by an occasional case that comes into our hands even nowadays when this method is employed. At the present day, we know we can do better work on the antrum by large intra-nasal openings than we can by inserting a drainage tube through either the alveolus or the canine fossa. There is no reason why tube drainage of the frontal sinus should be any more satisfactory than the tube drainage of an antrum.

"I believe that the cases which Dr. Ingals has cured by the introduction of his gold tube could have been cured by properly removing the obstructions around the outlet of the naso-frontal duct with cutting forceps. The passage of a trephine and the consequent removal of the mucous membrane from the naso-frontal duct is bound to result in a cicatricial contraction of the canal on the removal of the tube. This contraction, I think, would be sufficient to produce the same stricture that one occasionally sees after too vigorous curettage of the naso-frontal duct. The stricture does not prevent subsequent infection of the frontal sinus, but yet is of sufficient density to retain the secretion within the cavity until considerable pressure has developed, when a small amount is forced out. To my mind, these are the worst cases which come to us for treatment. It is impossible for us to insert a probe into the sinus, and an external operation is the only one which gives relief in these cases.

"I cannot understand how it is possible for the reader of the paper to expect a tube in the frontal sinus to drain the large orbital recesses that one frequently meets with and that communicate with the frontal sinus. Neither can I understand how it is possible for a tube inserted into the frontal sinus to thoroughly drain that cavity, any more than a tube inserted into the antrum thoroughly drains it.

"When the tube is in situ, reinfection of the frontal sinus is probable with each attack of acute rhinitis.

"I regard the writer's method as a most ingenious one, fraught with dangers, unsurgical so far as establishing the required drainage, unnecessary, because cases that can be cured by his method can be cured by simpler ones, and, lastly, ineffectual in that type of cases that demands rational surgical treatment, whereby the sinus is laid open, the diseased membrane removed, and the cavity obliterated, so that no future nasal inflammation may extend to and involve it."

Dr. Beaman Douglass was again requested to express his views on the subject, and said in part:

The views expressed by Dr. Coakley meet my approval and I endorse them all. I think that the subject is important enough for us to put ourselves on record for or against it, but hope that the presentation of the opposite side of the question of an intranasal operation on the frontal sinus will not be considered discourteous by our guest.

We may admit at the outset that an intranasal operation upon frontal sinus is desirable providing that it is not dangerous to the patient, that it gives as good results as other methods, and that it can be as easily performed by the operator possessed of an average amount of technique. The objection in this country to an external sinus operation is the resultant scar. The idea in regard to scars are different here and on the European continent. There where the civilization is still permeated with the idea of chivalry, where it is not unusual for a man to have a scar and where the women of the nation look upon them as marks of honor, a cicatrix is not objected to; but in this country where the idea of unblemished beauty predominates, scars are looked upon with distaste and aversion. Therefore if an intra-nasal operation upon the frontal sinus can be done safely it is certainly desirable from the American point of view, and such an operation as Dr. Ingals has presented, with only two failures in twenty-one cases merits our closest attention.

We must now consider the objections to the intra-nasal operation. These points were extensively discussed in my paper published in the Laryngoscope two or three years ago on "The Dangers of the Intra-nasal Operation upon the Frontal Sinus," and I would refer you to it for the nearer details, mentioning now only one or two of the more important objections. The real danger of the intra-nasal operation is the danger of perforating the exterior wall of the sinus with the burr, and subsequent death of the patient from pachymeningitis, or a perforation of the olfactory groove, with the same result. While there are many cases in which there is a large naso-frontal duct with a posterior sinus well out of reach of the operating instrument, there are also a number of cases in which the space between the orbit and the olfactory groove is so narrow that no considerable enlargement of the naso-frontal duct is possible without injury to the eye or the olfactory groove. There are also many other cases where the posterior wall of the sinus is so oblique that it bears an immediate relation to the naso-frontal duct, and it would not be possible to use a burr upon such sinuses without perforation of the posterior sinus wall. It is also a fact that these dangerous relations which may induce a fatal result cannot be determined before the operation.

In my opinion, all that can safely be done intra-nasally to secure better frontal sinus drainage is the removal of the middle turbinate body, the processus uncinatus, and the processus angularis, with the subsequent irrigation of the sinus and the application of various medicaments. It is very questionable whether it will do any good to attempt the enlargement of the naso-frontal duct, for this stirs up granulation tissue, and we have all seen even large intra-nasal sinus openings which closed months after an operation, thus interfering with drainage.

Finally, it is impossible by any intra-nasal operation to reach the pockets in large frontal sinuses or to drain the sinus where it extends posteriorly—sometimes as far as the sphenoid. In such sinuses the only benefit to be obtained from an intra-nasal operation is the relief of pain, and this can be secured by simple irrigation. Such large sinuses subdivided by septa and containing recesses in which infected granulation tissue is lodged can only be successfully operated upon by an external method. It seems to me that in the Killian operation we have an ideal operation upon the frontal sinus with a minimum of external deformity.

Dr. Ingals said that he certainly accepted in the most friendly spirit the criticisms which his paper had received. Dr. Douglass, however, had failed to appreciate what he had said about the modified burr with shield which makes the burr absolutely cut forward. It cannot cut backward. The canal without a drainage tube will close with the drainage tube it cannot close. Several other objections had been brought forward, but he knew of no better answer than to say that "The proof of the pudding is in the eating," and he is sure that those who try it as he has done will be pleased with it. The external operation is desirable in a few cases, but not often.

Dr. Quinlan moved that the thanks of the Section be extended to Dr. Ingals for coming before them and giving them this very new and very carefully prepared paper.

The motion was carried.

A Nasal Syringe for Infants (Mouche-Bebe). Dr. Escat, de Toulouse. *Presse med.* Aug. 25, 1906.

Very young children, suffering from coryza and not knowing how to clear the nostrils, are exposed to two kinds of complications due to the obstruction which results from the accumulation of mucus in the nostrils: First, a state of partial asphyxiation; second, an obstacle to nursing, due to this nasal obstruction. On this account, nutritution may be seriously interfered with.

To prevent these results, it is necessary to clear the nostrils of the child, several methods having been suggested for this purpose: First, the liquid douche, which may cause infection of the ears or irritate the lower respiratory passages of the child; second, the dry douche, by means of the Politzer bag, a method less difficult, but having the same risk as the liquid douche; third, cleansing the nostril by means of a sampon of cotton, a dangerous method unless performed by an experienced hand.

In view of the disadvantage of the above methods, Escat has devised a little instrument which he thinks will become popular, and which he has called a "mouche bebe."

This consists of a glass cup, one end of which ends in a conical opening adapted to the nostril of the child. Into the other end of the cup a tube is inserted, to the outer end of which a bulb is attached in order to create a suction within the cup. When the conical tip is applied to the nostril and the compressed bulb released, the diminished air pressure causes a suction which frees the nostril of its secretions. By removing the instrument and compressing the bulb, the secretions are expelled from the cup, which may afterwards be sterilized by boiling water. Scheppegrell.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, December 10, 1907.

J. HOLINGER, M.D., President.

Intra Nasal Drainage of Frontal Sinus. By E. FLETCHER INGALS, M. D.

DISCUSSION.

DR. H. STOLTE, Milwaukee: Is not the operation limited by a marked septal deviation.

DR. INGALS: Yes, that must be remembered.

DR. STOLTE: I have employed this procedure in three cases, successfully in two cases. In the third case there was a marked reaction; an edema in the lower part of the nasal duct, and so much pain, that I took out the gold tube and treated through the opening, simply by syringing. The case terminated successfully.

DR. INGALS: You ought to have left the tube in place. I saw marked edema in one case, the patient being in the active stage of syphilis.

DR. STOLTE: In my case there was marked deviation of the septum. I would like to ask Dr. Ingals whether he would do this operation in a hemophiliac.

DR. INGALS: I would do the operation in any case. It is done so quickly that the patient could not bleed enough to do any harm, and afterward you can pack with gauze. I use cocaine with suprarenalin and it stops bleeding at once.

DR. GOOD: How often does the tube cause irritation?

DR INGALS: Never.

DR. GOOD: How often does it cause acute ethmoiditis?

DR INGALS: Never.

DR. GOOD: What objection would there be in removing the anterior ethmoidal cells in every case.

DR. INGALS: I do not believe in doing a lot of things that are unnecessary, although it would not interfere with the operation.

DR. GOOD: If a larger cavity could be made so that the frontal sinuses could be examined and particles scraped out for microscopic examination, would not that be of considerable advantage?

DR. INGALS: It might in rare cases, but not usually. I have had two cases that seemed to indicate that larger opening was necessary.

At the orifice of the naso-frontal duct there was a valve-like arrangement of the mucous membrane, not enough to limit its caliber, but it acted in such a way that it would prevent air from going in.

DR. J. C. BECK: Do you always do this operation with the patient in the sitting posture?

DR. INGALS: In two or three cases I did it with the patient reclining; otherwise I always have had him in the sitting posture.

DR. O. T. FREER: The claim is made that frontal sinuitis is accompanied in a very large number of cases by suppuration of the ethmoidal cells; that a simple, uncomplicated frontal sinus suppuration is a rarity. What is your experience in that regard?

DR. INGALS: If the frontal sinuses have been suppurating, the burr has opened them enough so that any other procedure was unnecessary.

DR. W. E. CASSELBERRY: I have had occasion previously to express my admiration for the ingenuity which is exemplified in this instrument. It seems to fill the long felt need for an instrument with which one can with reasonable safety enter the frontal sinus through the nose. I have used it in one case successfully, three years ago, and I had an opportunity recently to examine the patient thoroughly, enabling me to report the result. The slight modifications which I used in the procedure, were, I think, quite immaterial, although they satisfied me a little better at that time than the conventional method as Dr. Ingals has related it. For instance, I did not use an electric motor, but substituted a plain strong handle, with which to rotate the burr by hand power, which worked all right. I did not make the operation all at one sitting but bored a little way in the first time, and about a week later bored in the rest of the way, and I was surprised at the ease with which I was able to make the large passage through to the frontal sinus. I did not use a gold tube or any tube, fearing that it might not be well tolerated as it is a foreign body. The patient returned to his home in Wheeling, W. Va., and had his local physician, Dr. Ackermann supervise the after treatment. The patient soon reported that he was getting along finely. He regained his former good health; the discharge lessened in quantity until it became very slight, the headaches ceased and his serious despondency and dazed mental state disappeared. About two years after the operation the physician in Wheeling who had subsequently provided himself with the Ingals instrument and who was sufficiently expert in nasal manipulations, again passed it through to the sinus, although I do not think, from his account, that it was really necessary, but rather, as he said, simply a precautionary measure against narrowing. At the end of three years when I again had the opportunity to thoroughly examine the patient, I found the passage widely open, a washing canula easily passed; the man could do it himself, if it were necessary, which it is not often, the secretion being very slight.

I call this patient practically recovered, and I do not believe that these patients often do get entirely and completely well either by this or other methods. There remains a slight discharge, perhaps from the ethmoidal cells, but it is not always even of a strictly purulent nature, usually mucopurulent, although at the time of an acute rhinitis, it is more nearly purulent. This is the degree of recovery, which in my experience can be looked for from the operation rather than an absolutely perfect recovery, but it is recovery enough. The patient is relieved of all serious symptoms, and the trifling secretion left amounts to nothing. Personally, I would rather have that than an external operation, with even, were it likely, a perfect recovery.

Dr. O. T. Freer: One condition contraindicating the intranasal opening of the frontal sinus should be mentioned. I refer to sinuitis frontalis exulcerans or exedens, as it is called by Killian. In this form of empyema of the frontal sinus the suppurative process has penetrated its walls by caries and direct perforation or else by the route of lymphatic extension or septic vascular thrombosis. Foci of septic inflammation are thus created outside of the confines of the sinus, forming most often in the orbit, after passing through the posterior sinus walls, but sometimes subdurally or in the frontal lobe. The usual extensions of the suppurative process beyond the limits of the sinus into the orbit are commonly accompanied by such marked swelling of the integument of the forehead and lids that their recognition is comparatively easy. Where suppurations external to the sinus exist the radical opening of the sinus from without is the only proper procedure.

I have had the honor to be associated with Dr. Ingals in his careful cadaver investigations and operations during the construction of his method of intranasal opening of the sinus and I regard it as so well planned and so perfectly adjusted to the anatomical conditions found that I can conceive of no other way of entering the frontal sinus through the nose which so perfectly combines safety with certainty.

Dr. George E. Shambaugh: I have little doubt but that the majority of cases of frontal sinus disease are better taken care of by intranasal work than by external operation. In the acute cases it is rare, indeed, that one must do more than apply local astringents or adrenalin about the middle meatus. In chronic cases, as a rule, the patient is, I believe, best treated by intranasal work, and most cases are treated satisfactorily without even using a burr to open the naso-frontal duct, doing no more, indeed, than to remove the anterior end of the middle turbinated body, thus allowing free escape of secretion from the sinus. In many cases I have seen, apparently, a complete cessation of suppuration in chronic cases following this procedure, and in most cases a complete relief of annoying symptoms. I think that these patients are usually better off than when operated on externally.

Dr. R. H. Good: I have operated upon several cases of frontal sinusitus with my method by the intranasal route and in one case there followed an acute ethmoiditis. Since then I remove the anterior ethmoidal cells as thoroughly as possible and have more satisfactory results. Furthermore, I find that when the anterior ethmoidal cells are thoroughly removed a much larger cannula can be introduced into the frontal sinus.

I consider Dr. Halle's burr No. 1 a dangerous instrument as it is very difficult to control a long drill run by motor power.

I believe in making as large an opening as possible without endangering the dura, so that the frontal sinus can be examined and curetted if necessary, and the drainage can take place more easily through a large opening than a small one.

Should the opening close with polypi or granulation it can be opened by using the stick silver nitrate.

I consider it only necessary to use a tube in very chronic cases and where there is a marked tendency to polypoid growth.

PRESENTATION OF SPECIMENS AND INSTRUMENTS.

Bony Septal Deflection. By O. T. Freer, M. D.

Dr. Freer presented a specimen of a typical bony deflection, beginning far back in the nose, and which can be removed easily by submucous operation.

Killian's Bronchoscopy Instruments. By G. P. Marquis, M. D.

Dr. Marquis demonstrated some new instruments devised by Killian for use in Bronchoscopy.

PRESENTATION OF CASES.

Sarcoma of Root of Tongue. By A. M. CORWIN, M. D.

The man had lost in weight, but complained mainly of a sensation of a mass at the root of the tongue. Family history was negative, as was the personal history, except for a gonorrhea and a complicating cystitis. A growth was evident on examination, occupying the base of the tongue and pressing on the epiglottis. A number of smaller growths surrounded the base of the parent growth, evidently springing from the faucial tonsils. The main tumor, about the size of a walnut, had been scraped by a local physician, and this was followed by symptoms of infection. The surface of the tumor was irregular; the tumor bled easily and was dark in color. The microscopic examination disclosed a round-celled sarcoma.

For some months the patient had griping pains in the epigastrium following the ingestion of food, liquid or solid. Trypsin injections were given, beginning with a small dose. The patient did not improve until he passed from the rectum what appeared to be a cast of the bowel. Improvement, both local and constitutional followed, and the man is now feeling entirely well. There has been no recurrence of the growth.

DISCUSSION.

DR. GEO. E. SHAMBAUGH: I reported a case of sarcoma of the base of the tongue several years ago in the American Journal of the Medical Sciences. These tumors are almost invariably small round-celled sarcoma. At that time, 1902, only nine cases in all had been reported, and all were of this type, except one, which was a spindle-celled sarcoma. My case was a large spindle-celled sarcoma.

In regard to the apparent beneficial effects of trypsin, it must be remembered that these tumors occasionally recover of their own account. Several of the nine cases reported had recoverd. One recovered following the use of injections of pyoktannin. Trypsin, however, should certainly be tried in these cases, and I am not prepared to say that the results in Dr. Corwin's case were not due to that agent.

DR. C. M. ROBERTSON: I do not believe that the trypsin did any good at all. It probably is one of those tumors that disappear for a while, and then metastases manifest themselves, in the liver or elsewhere. I think that in nearly all of these cases there is a recurrence, even after thirty years, as was shown in a study of cases of sarcoma of the eye in the Moorfield Hospital.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

Twenty-ninth Annual Congress. Washington, D.C., May 7 to 9, 1907.

A. W. DeRoaldes, M. D., President.

(Continued from the January number, page 80.)

CONTINUATION OF DISCUSSION OF DR. COAKLEY'S PAPER.

Dr. E. Fletcher Ingals: In 1905 I saw a little fellow 3 years of age, with a papilloma of the larynx. In this case I made the diagnosis with a spatula like the one shown by Prof. Killian. I did not operate until the spring of 1906, when I operated upon three children by the direct method. I first tried the spatula shown by Killian, but I got along better with one with a pointed end. I had some trouble with contraction of the larynx, because I did not use cocaine, being afraid to employ it. I removed the papillary growth completely in all three cases; but it recurred in two, and one of these has it still. Two patients are now cured. In one case I did the operation without tracheotomy. I cleaned out the larynx perfectly, I believed; and I had a good view of it. While I was performing the operation the larynx began to close. The child could not breathe, so I had to do a quick tracheotomy to save its life, for I had no intubation tube. The other cases came to tracheotomy also, so I came to the conclusion that tracheotomy is best in all cases in young children, though Prof. Coakley's experience has demonstrated that it is not absolutely necessary. In the one case it was very necessary, and in one of the other two it had been already performed by someone else. One child is now wearing a tracheotomy tube, with a papilloma completely filling the upper portion of the larynx. I had already removed the growth three times, so I concluded to wait before doing it again. Someone, I can not remember who it is, says that papillomata often disappear in young children; so I am waiting to see what will happen. He is breathing all right through the tracheotomy tube. I had intended to remove the growth during the past winter, but the mother is satisfied with the patient's condition.

In one case I used a preparation supposed to have some influence in removing these growths or in preventing their occurrence. It is a preparation of iodine and silver, but I do not know just how it is made. It did not prevent the return of the growth in another case, however. I have also used iodin and carbolic acid.

DR. J. PAYSON CLARK: I once had the pleasure of reporting before the society a number of cases of papilloma of the larynx in children. My conclusion was that in such operations in children a preliminary tracheotomy is best in all cases because I found that on removing a papilloma it was of very frequent occurrence that the growth recurred with greater rapidity and over a new surface in the larynx. In other words, the operative interference seemed to stimulate the growth, and the larynx would be more filled up than ever. I did not feel it safe to operate on these children without performing a previous tracheotomy; so that is the method that I have followed in all cases since, with very good results.

Two of the cases that I reported two years ago were then still wearing tracheotomy-tubes. These have been removed and the patients are perfectly well.

In removing the growths I have used the direct method. I have also employed the tube-spatula. The latter instrument does offer great advantages in certain cases in which the autoscope does not work, the epiglottis sometimes getting in the way and interfering with the view.

I should like to ask Dr. Coakley whether there has been any recurrence in either of the cases he spoke of. I should be much surprised if there has not.

Another point is that when a previous tracheotomy is performed the larynx has perfect rest. In that condition the growth is much more likely to atrophy than when the child is using the larynx to breathe through.

DR. EMIL MAYER, New York City: As a contribution to the use of the Killian tubes, my own experience is that the head-light becomes intolerably hot within a very short space of time; so much so that work has to be discontinued to allow it to cool. The latest addition that Prof. Killian has made to the tube appeals to me, as the handle has the light attached. I trust that the Professor has his tubes with him, that the Association may have the advantage of seeing the newer tubes, which aid in the examination of the trachea, bronchi, and larynx very much more than with the former method.

My own experience tallies with that of the other speakers, that attempts to remove the growth from the larynx alone are likely, in children, to be followed by recurrences.

Dr. Swain: I have taken great interest in this paper of Dr. Coakley, and in the discussion that I hope Dr. Killian will give us; because I think that this field is one in which we have been at a loss to accomplish good results. As Dr. Clark demonstrated in his paper read a couple of years ago, our best method of treating papilloma up to the present time is to perform tracheotomy, and keep the tube in until the growth has shrunk as the result of the cessation of activity in the larynx. Papillomata in the larynx are not different from warts in other situations. If we pick a wart on our hand until it bleeds it will spread. It is the same with instrumental interference with papillomata of the larynx; it causes a recurrence of the growth. We have to steer clear of two dangers; that of not doing enough and that of doing too much. I believe that it is good policy to put in the preliminary tracheotomy-tube and let the larynx rest until the great congestion has disappeared, as it will do. I have a child now under my care. A year and a half ago she had a papilloma. I put in a tracheotomy-tube, and the wearing of this has made the growth shrink. I have meanwhile been trying to acquire skill in the use of the Killian instruments. The growth being in a quiescent state, I think I can get rid of it without danger of recurrence if I can become skilful enough in the use of the instruments to remove it without wounding the tissues greatly. It is a vastly different thing to operate by direct tracheoscopy from performing a thyroidotomy. We have all had the growth return, and have had to do the operation over again or leave the tube in permanently. Having first reduced the congestion and got the growth in good condition, we can remove it perfectly well.

I am a novice with the Killian method, which I have been using only two or three months; yet it is surprising how much I can do under anesthesia. It pays to take time, using plenty of adrenalin and cocaine in the anesthesia cases. In this way a great deal of time will be saved. There will not be much bleeding, and you will be able to cauterize with any substance you see fit to use: Clear carbolic acid has served nicely in one case, although it is too early to report the result in that instance. From the standpoint of a novice, I can but emphasize what the other gentlemen have brought to your attention, that by the direct method you can accomplish a great deal; and I think that we ought to use it more frequently.

Dr. William Lincoln: I agree very heartily with what has been said as to the extreme troublesomeness of these papillomata of the larynx. A method like this would be welcome by all. What we should all do is to help along in perfecting these instruments and this technique. After all, there will never be a time when the distinguishing marks of papilloma of the larynx will not be an extreme susceptibility to irritation, and to growth as the result of irritation in the larynx by any instrumentation. That, we probably shall never overcome; yet I think that this direct method is a great deal less objectionable on that account.

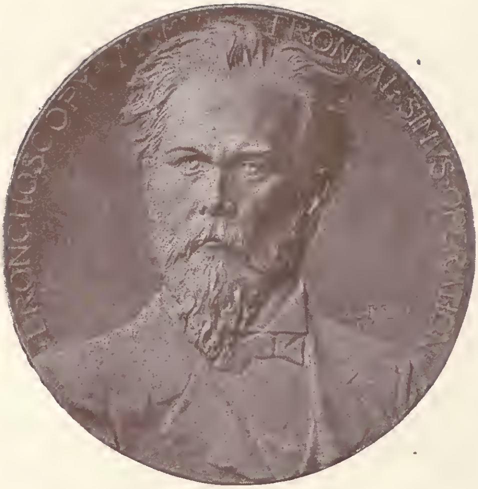
I have recently had a case of marked papilloma of the larynx under my care. It has no distinguishing features, but is, nevertheless, a very instructive one. The child had a tube inserted nearly three years ago. It has been operated on repeatedly, with the usual result of continued and more rapid regrowth. The larynx was then put at rest; and there was a cessation in the rapidity of the growth, and a shrinkage took place. Other means were tried, but the growth remained about the same. Finally, there was a marked growth about the orifice of the tube in the trachea. A large papilloma was found in that place. This child was hard to do anything with, and it was suggested that the X-ray should be tried. This was done, with immediate and gratifying results. The tumor, which was very large (about the size of a large marble), shrank up and disappeared within three or four weeks. This result has encouraged me to advise the regular use of the light through the body of the larynx, which has been carried out for four or five months, twice a week. The growth has shown a very encouraging tendency to decrease. Whether it will entirely disappear I am not certain. I am inclined to think that, as is usual in such cases, it will diminish to a certain extent and then stop.

Dr. William E. Casselberry: It is said that habit is a strong force in regulating our conduct; and I confess that, whether for this reason or for others, I have some feeling of reluctance to permit the operation of thyroidotomy for papilloma to be wholly and completely put into the background. I have had a limited experience, and have succeeded somewhat in removing papillomata from the larynx by means of the tube-spatula; and I do not look upon this procedure as being so easily accomplished as our friend from New Haven has described it to be. I have encountered difficulties with the tongue under general anesthesia, supplemented by the use of cocaine; and also in keeping the tube where I could get good illumination. It is a better method in the majority of cases than is the infra-laryngeal operation with the mirror, and should be developed to the utmost; but it is said that cases will recur, even after the direct method of operation. There are a number of circumstances that should be taken into consideration in selecting the method of operating. The convenience and possibilities of the patients and their parents, as well as their financial condition and the location of their residences (out of town people being compelled to remain away from business with their children in the cities and hospitals), are all the basis of arguments brought to bear upon us to induce us to make, if possible, not a mere removal of the papilloma, but a cure of the case. It should be our purpose in many cases to cure the papilloma of the larynx. This may be impossible by any method; but it still stands to reason that the more complete view, and the better access to the site of the papillomata afforded in thyroidotomy affords a better opportunity for thorough extirpation at a single operation than does either the direct or the intra-laryngeal method. I have a feeling that, in the circumstances that I have mentioned, when the convenience and the abilities of the patients and their parents to take a long course of treatment must be considered by us, thyroidotomy still has a place in the treatment of papillomata of the larynx, especially in those cases in which recurrence has shown itself liable to take place, and in which we should make a thorough attempt to cure within a brief space of time.

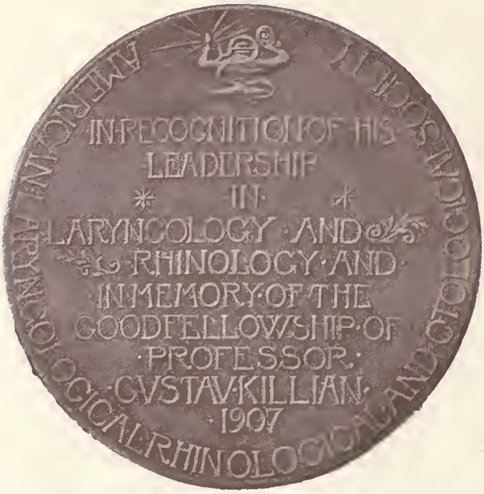
A Case of Abnormal Development of the Esophagus. J. E. Spicer. *Lancet*, Jan. 19th, 1907.

The author has already described two similar cases of congenital malformation in the *"Journal of Anatomy and Physiology,"* Vol. 41, 1906.

The present case was identical and was due to maldevelopment of the tracheo-esophageal septum in the anterior part of the primitive esophagus. As a result the upper part of the esophagus ended in a dilated cul-de-sac, while the lower part of the esophagus opened above into the posterior wall of the trachea immediately above the bifurcation. The child also suffered from imperforate anus, and died twenty-two hours after birth. St. Clair Thomson.



FAC-SIMILE OF THE BRONZE MEDALLION VOTED BY THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY IN COMMEMORATION OF THE VISIT OF PROFESSOR GUSTAV KILLIAN AS ITS GUEST IN JUNE, 1907.



THE
LARYNGOSCOPE.

VOL. XVIII. ST. LOUIS, MO., MARCH, 1908. No. 3.

ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

RESEARCHES ON THE VOICE.*

BY E. W. SCRIPTURE, PH. D., M. D., NEW YORK.

In speaking or singing we use a current of air from the lungs to arouse vibrations in the vocal cavities. These vibrations are waves of condensation and rarefaction, or variation in the density of the air. They constitute the voice. These variations in density spread from the mouth of the speaker to the ears of the hearer. Of course, no particles of the air itself travel in this way.

Tonight I shall illustrate three methods of studying the voice, each of which has its limitations and advantages.

The simplest one is the graphic method. The most usual apparatus for this method comprises a revolving cylinder covered with paper which is coated with soot. To get records from the mouth the person speaks into a mouthpiece from which a rubber tube leads to a recording capsule. This latter is a small metal box with a top of thinnest sheet rubber. The vibrations of the voice pass down the tube and set the rubber membrane in motion. By a light straw lever the movements are recorded in the soot on the drum. In a similar manner records are obtained from the larynx, the lips and the nose.

As the usual recording drum is too small for lecture purposes, I use a wheel of glass coated with soot by being held over a candle flame. This is placed over a projection lantern so that a portion of the wheel comes where the slide ordinarily does. Any mark in the soot shows as a white line on the screen.[1] I will now use this for various illustrations of registering the voice.

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* Address by invitation before the Section on Laryngology of the New York Academy of Medicine, November 27, 1907.

[1] The lantern recorder is described in detail in my "Elements of Experimental Phonetics," Ch. II.

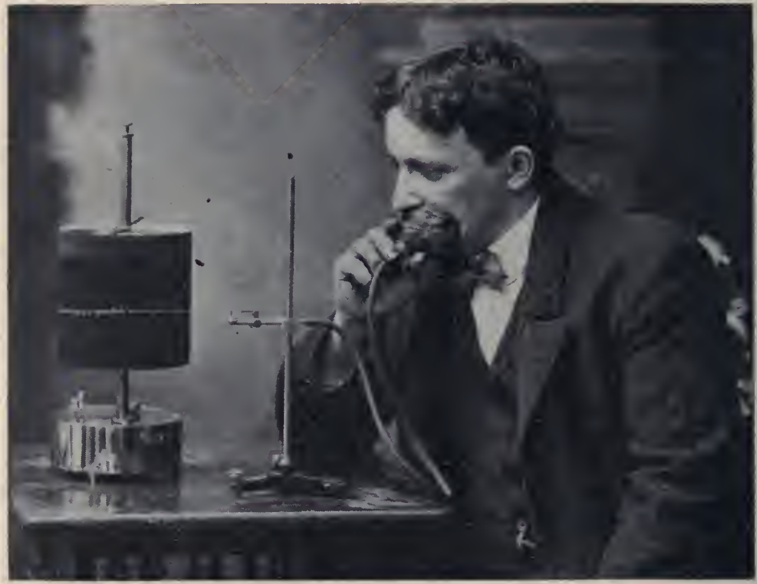

Fig. 1. Making a mouth record.

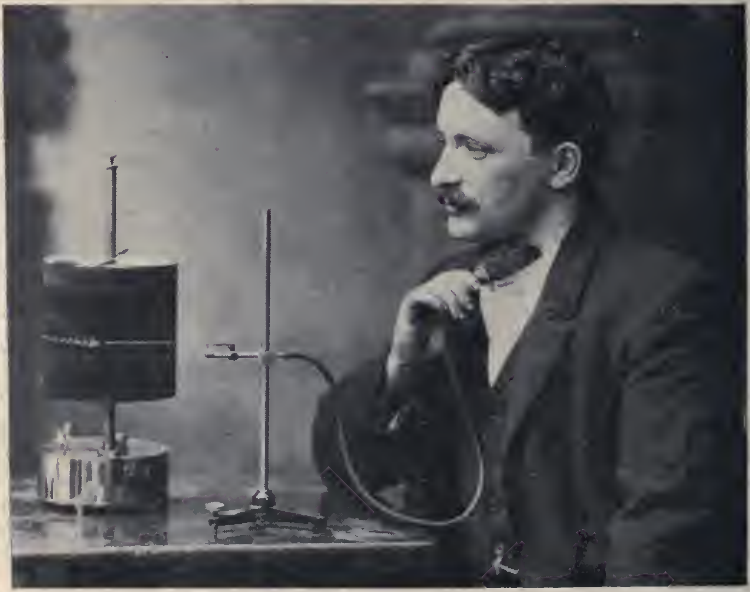

Fig. 2. Making a larynx record.

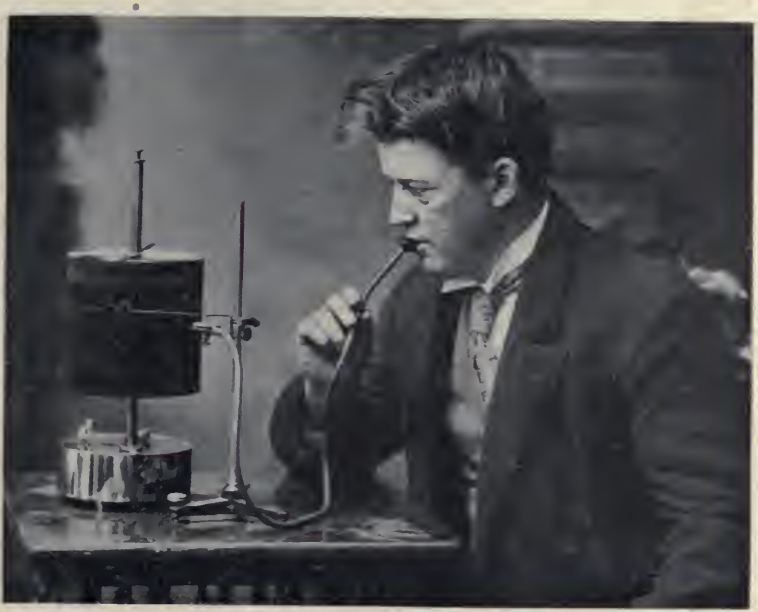

Fig. 3. Making a lip record.

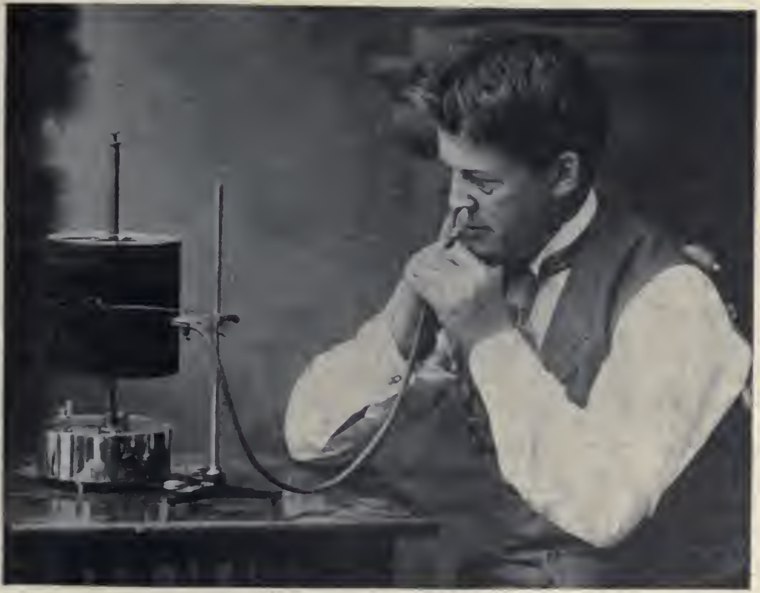

Fig. 4. Making a nasal record.

Let us first get registrations of various sounds issuing from the mouth. (Registrations were made of the lecturer's voice in the words "papa," "father," etc. of a vocal teacher's voice in tones with various attacks and in tones with tremolo and vibrato, etc.) By using a little rubber bulb just in front of the tip of the tongue we can register the tongue movements. Records were made of the tongue movements when Dr. Swain spoke the alphabet. When Dr. Swain was told to keep his tongue absolutely still, but to think the alphabet, the apparatus showed movements of the tongue, although he supposed he had kept it absolutely still. Records of nasal sounds and laryngeal vibrations were also made by the arrangements shown in the Figures.

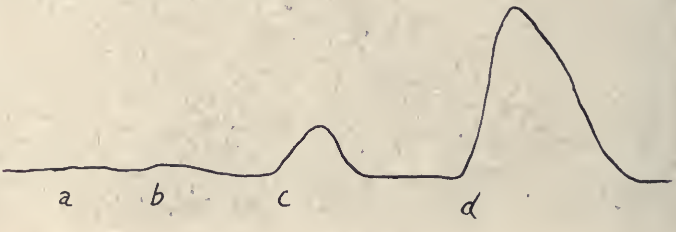

Fig. 5. Tongue movements while speaking the alphabet (Dr. Swain).

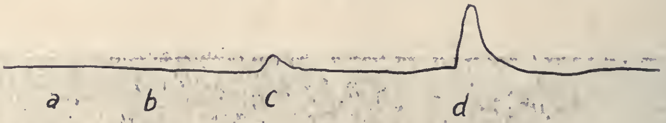

Fig. 6. Tongue movements while thinking the alphabet (Dr. Swain).

Let us now turn to the registration of the voice by the phonograph and the gramophone.

When recorded on the phonograph, the waves make indentations that vary in depth. When recorded on a gramophone, the waves consist of sidewise vibrations with a constant death.

I cannot take the time to describe the steps in the process of making a phonograph or gramophone record. The result is familiar to all of us, namely, a grooved line that can be made to talk. Suppose, now, we select a record of this kind that produces sufficiently good sounds to be considered reliable. We must then find a method of accurately tracing off this groove upon paper. As most of my work was done with an apparatus for tracing gramophone records, I shall confine myself to a description of it.[2]

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[2] This work has been liberally supported by the Carnegie Institution of Washington, D. C., for four years. The first volume of results has appeared as Publication No. 44, "Researches in Experimental Phonetics."

The gramophone disc is made to turn very slowly, once in six to ten hours. A steel point in a very long, light lever rests in the speech groove just as the steel point of the reproducer does; the vibrations in the groove make the lever move back and forth. A fine point at the end of the lever records the vibrations, magnified 430 times, on a long band of smoked paper.

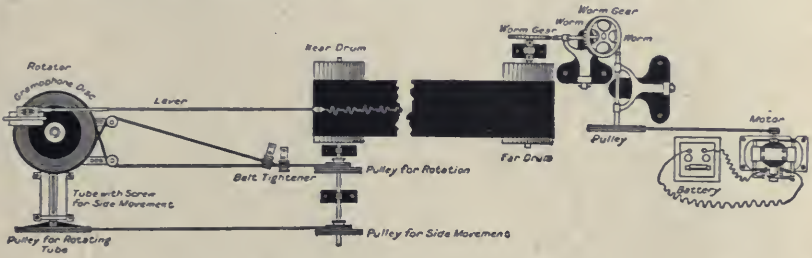

Fig. 7. Machine for Tracing Gramophone Record.

Here (Fig. 8) we have a piece out of a record of "oh" spoken by Dr. S. Weir Mitchell. The piece has been cut into four parts to get it into the column of print. We notice first that the waves fall into groups of three; each group represents one vibration from the larynx. By measuring the length of a group we can get the pitch of the tone from the larynx at each instant. We find that the length of the group steadily changes. If we indicate the pitch for each group by a dot a certain distance above a horizontal line and connect the dots, we get a "melody plot." The melody plot for the entire "oh" of which Fig. 8 is a part is given in Fig. 9. It shows that the voice begins low, rises quite high, quavers a while, and then falls. In the melody plot we thus have a record of the emotion. This opens up an entirely new field, that of melody in prose and verse; the melodies of whole speeches, poems and songs have been obtained.

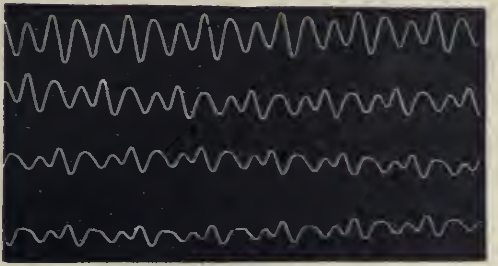

Fig. 8. Waves foom "Oh," spoken by Dr. S. Weir Mitchell.

Each group in Fig. 8 comprises three subordinate waves; these indicate the tones of the vocal cavities. In the first line of the figure the three strong waves indicate that there is a powerful cavity tone an octave and a half above the larynx tone. But we notice that, although adjacent groups are similar, the form always changes slowly and steadily from beginning to end. This is true of nearly all American vowels; the sound of each one changes steadily while being spoken.

The vibrations that compose a wave group are the effects of the laryngeal vibrations on the cavities of the mouth and nose. They differ for each different vowel sound. Here are short pieces out of a number of vowels spoken by Joseph Jefferson (Fig. 10). Let us notice the vowel "a" in "glass." We find a similar but weaker curve for the same vowel in "that," an almost identical curve in "schnapps," a distantly similar one in "and," and a rather similar one in "family's." The long "a" is shown in weak vibrations at the beginning of "ah." In this way we can go over the plate of curves and pick out similar or dissimilar ones with the unaided eye.

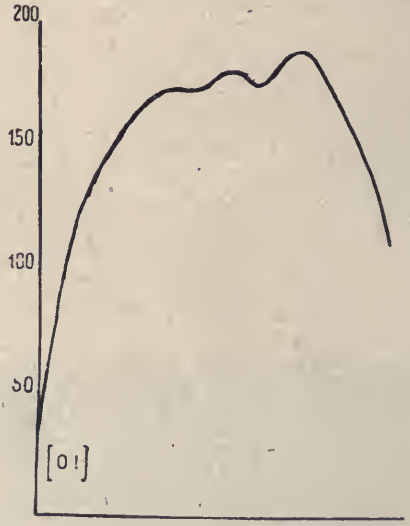

Fig. 9. Melody Plot for "Oh," sorrowfully.

If we inquire what tones of the voice are represented by these curves, we have to face the problem of curve analysis. This is a difficult and complicated process, the analysis of a single wave often requiring whole days of computation. The results of thousands of such analyses show that the prevailing views of speech and the action

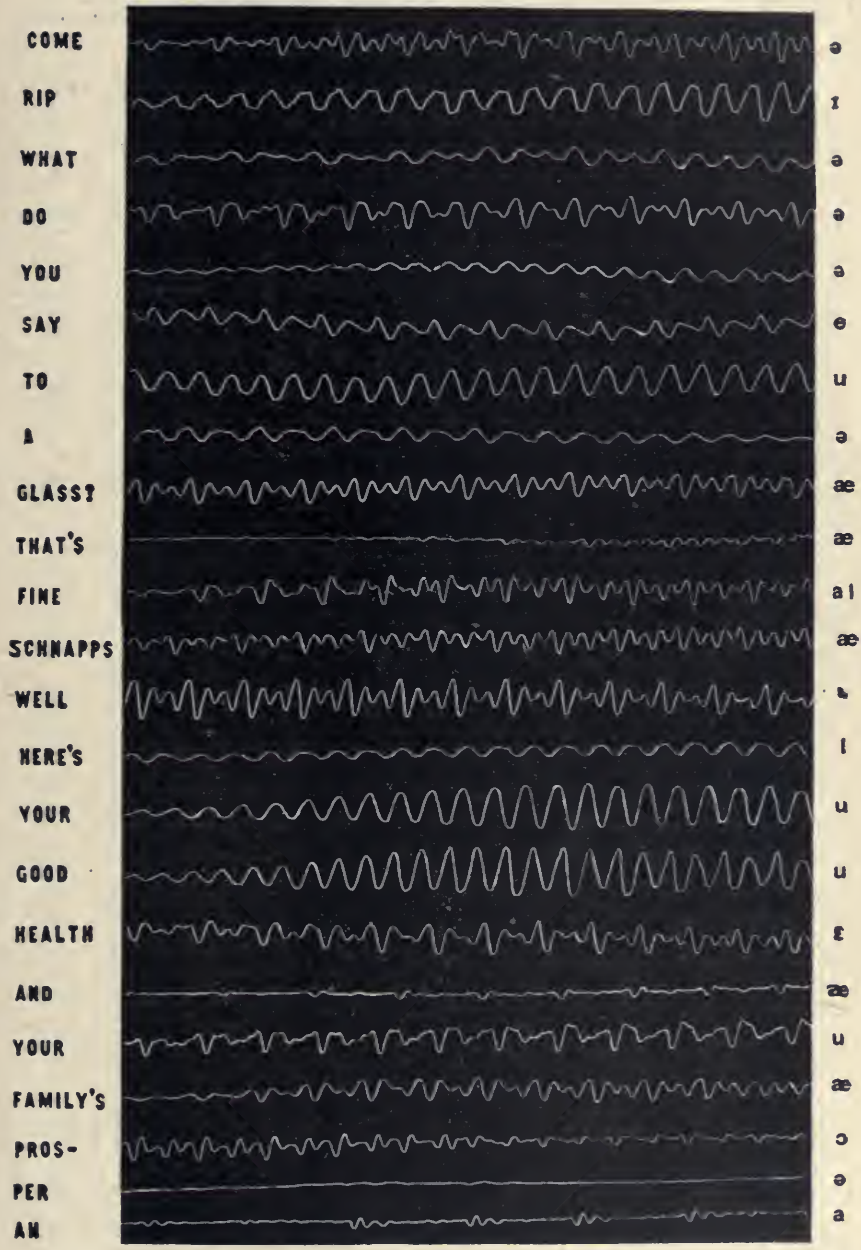

Fig. 10. -Gramophone Tracing of Vowels of Rip Van Winkle's Toast, Spoken by Joseph Jefferson.

of the vocal organs are largely erroneous. Brought into connection with the facts of anatomy and physiology, they give us an insight into the human voice such as we never had before.

In the first place, it is generally supposed that the larynx contains two cords or two membranes which swing in the breath current and set the air in vibration. This is not true. The larynx contains the two "vocal lips," which open and shut by compression; the larynx thus emits a series of puffs of air, just as a locomotive or a siren does, but so fast that the puffs make a tone.

Again, it is supposed that the vocal cavities—chest, throat, mouth, nose—act like brass resonators to reinforce certain overtones of the laryngeal vibrations. This also is not true. The vocal cavities have soft walls and cannot act like brass resonators; their tones do not coincide with overtones of the laryngeal tone and therefore cannot reinforce them. The cavities are adjusted to certain tones for each vowel; the puffs from the larynx strike them and bring forth these tones.

Although this puff theory of vowel action has been definitely established, it has not yet become known to any extent, and it is safe to say that no American book that discusses the voice has gotten beyond the old Helmholtz resonator theory, and that every vocal teacher bases his or her instruction on an absolutely false supposition.

Turning now to pathology I will say that I have in preparation a study of speech in general paresis and am about to publish (in connection with Dr. L. Pierce Clarke) a monograph on the speech of epileptics. It is interesting to note that the epileptic has a distinct type of speech, which the ear can learn to recognize and use as a diagnostic test.

87 Madison Avenue, New York City.

Diphtheritic Inflammation of the Middle Ear. LEON LEWIN. *Arch. f. Ohrenh.*, Leipzig. Dec., 1904.

The author criticized Kobrak's conclusions. (See THE LARYNGOSCOPE, Vol. XV, page 164). According to Lewin, the term diphtheritic inflammation should be limited to those cases in which there is typical membrane formation, on account of the difference in the clinical course of the cases. YANKAUER.

A SUGGESTION AS TO THE PROBABLE FUNCTION OF THE MALLEUS, INCUS AND STRAPES.

BY OTTO GREENBERG, MILWAUKEE.

The part played in audition by the chain of ossicles of the tympanum is more than ever a mooted question; and is not infrequently referred to by otologists as the mystery of the chain of ossicles.

The function of transmitting sound waves from the tympanic membrane to the fenestra ovalis early attributed to the ossicles, fails to explain the hearing that largely continues after the ossicles are extirpated, nor does it account for their very peculiar structure and arrangement.

After carefully examining these peculiarities and the relation the same may bear to the rate of sound vibrations, together with Weber's law of sensation, I was led to suspect that the function of the ossicles as regards sound transmission is not merely to transmit sound vibrations from the tympanic membrane to the fenestra ovalis, and to concentrate the force of same, but, more particularly, to render equal the stimulating capacities of the high and low tones.

Other things being constant, I believe, as hereinafter more fully treated, that the higher the tone the greater is its capacity to stimulate the auditory nerve endings.

By reason of the inertia of their more massive parts, the ossicles respond differently to the different rates of vibration in such a way as to convey to the foot of the stapes less of the amplitude of a tone received at the tympanic membrane in high, than in low tones. The statement of Helmholtz that the foot of the stapes vibrates a distance of about two-thirds of that of the manubrium of the malleus may be true, but it is my belief, that this is so only in the transmission of a particular tone; being less than two-thirds in the transmission of a higher tone, and greater, in the transmission of a lower tone.

The results of research recorded by a number of investigators as well as my own investigations, and the anatomy of the parts involved are readily explainable on this hypothesis.

Within a reasonable limit, a given energy produces a sound of certain intensity of sensation or loudness, be the pitch produced high or low, as witnessed in such instruments as the piano, violin and clarionet. But during the period of a single stimulation of the auditory nerve endings by one vibration of a tone of 100 vibrations per second, a tone of 30,000 vibrations stimulates the endings 300 times. That each of these tones be heard alike in intensity it seems that each individual vibration of the former should produce a sensation 300 times greater than that of a single vibration of the latter. But this cannot be so, for while it is true that the amplitudes of the vibrations of the respective tones do approximate such a ratio, their powers to produce sensation does not approximate such a ratio; for Weber's law amounts to this: that if a stimulus of intensity or amplitude A, causes a sensation counted as 1, a stimulus of intensity or amplitude 2A does not evoke a sensation as great as 2; and, of course, a stimulus of intensity or amplitude 300 A must evoke a sensation very much less than 300. Were it not so, a sensible stimulus added to a pre-existing strong stimulus would evoke as great an increase of sensation as if added to a weak stimulus. Now, representing the stimulus or amplitude of the tone of 30,000 vibrations by A, and that of the tone of 100 vibrations, by 300 A, it follows that A will evoke a sensation much greater than 1-300 of the sensation evoked by 300 A. On multiplying these sensations by their respective frequency, it seems that the higher the pitch the greater is its capacity to produce sensation, and the louder should it be heard, were it not, as I believe, for the interference of the chain of ossicles.

The following observation has been made by experiment according to Scripture*: The mental intensity of a sound varies as the logarithm of the physical intensity or amplitude, a relation that has been established for certain tones. The exact expression of the relation is: $I = C \log . E$, where I is the intensity of sensation, E the physical intensity of a tone of a certain pitch, and C a personal constant, and where log. indicates the logarithm with the basis e (natural, not Brigg's logarithm, approximately 2.7).

In other words, an increase in amplitude in any ratio is not associated with an increase in intensity of sensation in the same ratio but with a very much reduced increment, so that in comparison with a high tone, the greater amplitude of a low tone does not make up the loss in capacity to produce sensation by reason of its smaller number of stimuli.

If the higher the tone, the greater its capacity to produce intensity of sensation or loudness, be so in fact, then means for rendering equal the sensation of the low and high tones must necessarily exist. The peculiarities in the chain of ossicles are most suitable for furnishing this very means, bringing about equalization in loudness, by transmitting to the fenestra ovalis, a decreasing fraction of the movements received at the manubrium of the malleus with increase in pitch.

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*The Elements of Experimental Phonetics, p. 109. Yale, Bicentennial Publication, July, 1902, and Fechner, Elements der Psychophysik, 2 Anfl., Leipzig, 1889.

It will be recalled that with the exception of the articulation of the stapes in the fenestra ovalis, the ossicles are yieldingly suspended on ligaments and on the tympanic membrane, so as to be capable of almost universal movement. A structure such as this is peculiar to these ossicles; nowhere in the body is there a similar structure, and it is not amiss to attribute function thereto. Universality of movement is a necessary element in executing the function here attributed to the ossicles since each tone must be a law unto itself in respect to the character of the movement it imparts to the chain of ossicles. It may also be here noted that the short process of the incus is not anchored by ligaments in the posterior wall of the tympanic cavity, but lies free of the wall, suspended near it by two fibrous bands, one on its anterior, the other on its posterior surface, so as to allow of movement in all directions, even in that of the long axis of this process.

The long process of the malleus, anchored in the Glaserian fissure, is osseous only in the new born, being entirely replaced by a ligamentous band in the adult, whereas the reverse takes place in all other osseous changes. This change from the osseous to the ligamentous is indicative of improvement in function of the latter condition. That it improves the condition for variability in character of movement of the chain of ossicles is quite certain.

The development of the ligamentous from the osseous may be explained by an increase in nutrition of the elastic constituents of the process in which the osseous do not share, and which may be brought about by the greater activity of the ligamentous or flexible elements of the process, induced by sound vibrations tending to bend the process at various points along its length, depending upon the rate of the vibration.

The distribution of weight in the ossicles is extraordinary, but such as to offer ideal conditions to inertia to resist the transmission of sound vibrations in a way as to increase the resistance with increase in pitch.

The head of the malleus and the body of the incus are noticeably large for ossicles of their size. This is not due to the requirements of their large articulating surfaces, for the cross-sectional area of either is greater than the surface area of the articulation. In fact, the head of the malleus extends up and free, beyond the superior margin of the articulation. The head of the malleus and the body of the incus are solid throughout, containing no marrow; and since the stapes does contain marrow and the manubrium of the malleus is not solid, these anomalies cannot be due to the demand for strength, but as I believe for weight. In fact I have determined the specific gravity of these ossicles and their parts, and have found the unusual—the larger the part the greater its specific gravity. The method employed for these determinations consisted in floating the ossicles and some of their chosen parts, together with pieces of the solid wall of the shaft of the femur, for comparison, in a large test tube containing methylene bromide, which has a higher specific gravity than bone. I added ether, drop by drop, until the head of the malleus, which was first to descend, remained suspended in the solution. I then determined the specific gravity of the solution at this stage of dilution, and thereby that of the head of the malleus, employing a pyknometer devised for these experiments to attain greater accuracy.*

In like manner I determined the specific gravity of the other bones and parts. The order of increasing specific gravity is as follows: the stapes, section of bone free of marrow from the shank of the femur, the neck of the malleus, the incus, and last and greatest in specific gravity is the head of the malleus. The above order was found true in ossicles taken from six different heads. I found the specific gravity of the head of the malleus to be 2.08619, the incus 2.05311, the femur (shank) 1.83661, the stapes 1.77790, and the manubrium of the malleus 1.69875. The calf was used in these investigations. The ossicles are large and more readily removed in this than in most other animals.

It is quite probable that when the ossicles transmit sound waves, the vibrations of the head of the malleus, because of its greater mass and, consequent, greater influence of inertia at that particular point, will tend to assume a character of movement having the smallest amplitude. This tendency, of course, increases with the increase in rate of vibration, so that the higher the tone transmitted the less of the original movement at the tympanic membrane will be taken up by the head of the malleus, and the incus will therefore receive less movement and in turn the stapes and labyrinth will be so effected.

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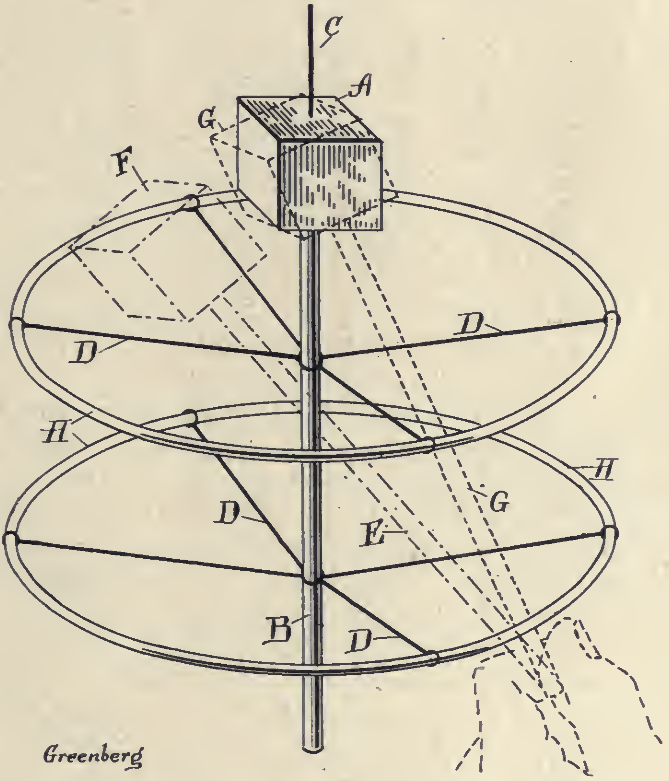
*Otto Greenberg, Science, Sept. 7, 1906, page 314.

Likewise the greater resistance offered by the body of the incus to the more rapid vibrations, because of its weight, will result in loss of amplitude at the melleo-incudal articulation, here, too, the loss will increase with increase in pitch. The prominences of the articulating surfaces will probably glide one on the other and the energy be wasted in stretching the capsular and other ligaments, rather than transmit the full vibration against the influence of inertia. The tooth of the articulating surface cannot act as a perfect lock to the articulation, for even if it cannot glide in both directions, the articulating surfaces may glide about this tooth as center. The meniscus in the articulation points to freedom of movement and octive function.



That the ossicles are peculiarly subject to the influence of inertia is corroborated by Politzer, who, in experimental pathology, found that, while only a slight change in the movements of the ossicles takes place on weighting the tympanic membrane, a very marked change is noticed in the movements when the ossicles themselves are weighted. As to what would occur were the head of the malleus or the body of the incus weighted in connection with the effect on this of low and high tones, cannot be determined from the experiments of Politzer.

The drawing illustrates a device with which the nature of the movements of the malleus as affected by pitch can be demonstrated. A is the body of a metallic block, secured to the upper end of a stick B. The metal block corresponds to the head of the malleus and simulates its high specific gravity; the stick B corresponds to the lighter manubrium. From above the device is suspended by an elastic band C. Assisting, somewhat, in suspending the device, and retaining it normally in a vertical position, are eight elastic bands as at D fixed to frames H.

On slowly moving the lower end of the stick back and forth to one side, in dot and dash lines as at E, and then to the other, the block moves back and forth in the opposite direction a considerable distance as at F; when the stick is moved back and forth more rapidly, the excursion of the block is very much reduced in amplitude, and when it is shaken very rapidly, though through an arc of equal degree, the block retains its position and merely oscillates about its own center of mass, as shown in the dotted lines G.

Clinical observation shows that with but few exceptions, the higher tones are better perceived than the low in ankylosis of the ossicles. This is also true where the functional power of the ossicles is otherwise interfered with or lost as by inflammation: as well as when they are entirely removed. Mader and Exner* found that high tones are heard louder than the low when sound waves are conducted to the ear through the cranial bones, as by placing a tuning fork against the skull.

Thus when sound waves reach the auditory nerves through paths other than the chain of ossicles, the higher tones, now meeting with no discrimination by the ossicles, as compared with the low, are heard louder than the latter. In other words, all tones are heard less well, in these cases, because the ossicles do not transmit them; and the higher tones are heard louder than the low because the function that I attribute to the ossicles, that of equalizing the stimulating capacities of the various tones, is absent in these cases.

In the observation of sound transmission through the skull, Mader advanced the opinion that the skull is a better conductor for the higher tones, as an explanation of the phenomenon; but a substance which will conduct one tone better than another, for such a short distance is unknown to physicists, as far as I have been able to discover.

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*Microphonische Studien am schalleitenden Apparate des menschlichen Gehoerorganes, Sitzungsberichte der K. akad d. w. 1900.

Bezold** was even led to believe from the clinical observations, above mentioned, that the ossicles transmit the low notes, but take no part in the conduction of the high ones. Of course, no line can be drawn between those tones which are transmitted one way, and those another way. It is much more probable that the chain of ossicles transmit all the notes, but vibrate differently and to a different degree in the transmission of the various tones, being specially adapted to do this, as I have already pointed out.

In the near future I hope to test the correctness of the theory suggested as by actual measurements of the excursions of the stapes and manubrium of the malleus.

Medical Dept. of Marquette University.

**Bezold, Ueber d. functionelle Pruf. d. menschl. Gehoer., Wiesbaden, 1897, § 118-122.

A Contribution to the Pathology of the Labyrinth. ZERONI. *Arch. f. Ohrenh.*, Leipzig. Dec., 1904.

Zeroni had an opportunity to observe a case of labyrinthian disease during life, and to study the labyrinth microscopically after the death of the patient. Among the many interesting features of the very complete account of the case is the explanation of the vertigo from which the patient suffered by the presence of a necrosis of the wall of the horizontal semi-circular canal.

YANKAUER.

Menigococcus-Pharyngitis as the Means of Propagating Epidemic Cerebro-Spinal Meningitis. A. Osterman. *Deut. Med. Woch.*, Leipzig. Mar. 15, 1906.

Osterman examined the mouth and pharynx of a number of healthy persons for the meningococcus and found it present in varying numbers, especially in persons living near cases of epidemic cerebro-spinal meningitis. Such persons are undoubtedly the means of spreading the disease to which they are themselves immune.

YANKAUER.

REPORT OF A REMARKABLE CASE OF SIGMOID SINUS THROMBOSIS WITH MULTIFORM SEPTICO-PYEMIC COMPLICATIONS EXTENDING OVER A PERIOD OF FOUR AND A HALF MONTHS. ULTIMATE DEATH.*

BY JOHN R. WINSLOW, M. D., BALTIMORE, MD.

I was summoned, in conjunction with Prof. Randolph Winslow, April 13th, 1901 (Afternoon), by my friend Dr. Henry F. Hill, in consultation upon a school girl, aged seventeen years, presenting the following history:

Patient had scarlet fever when 7 or 8 years of age, followed by a discharging left ear; this was arrested by treatment and there had been no discharge for two or three years prior to this sickness. Present attack began ten days previously with sore throat, fever, cough and aural discharge; the patient did not seem ill, however, until April 12th, when the temperature registered 105.8°, pulse 120,

Upon examination the following day, I found the *left ear* stone deaf, but the shouting voice could be heard when almost in contact with the right ear. The left eye-lid was edematous (Stirling's sign), but could be elevated, there was some exophthalmos (phlebitis of cavernous sinus?), but the movements of the globe were good. Patient could count fingers. No ophthalmoscopy.

Edema behind the mastoid and down the neck (Griesinger's sign), well marked. The bone itself was not very sensitive. Tenderness of upper posterior cervical triangle (Whiting's sign) absent. The face and neck were moist but sweating was not profuse; no tenderness along the course of the internal jugular vein. Temperature 103°, pulse not recorded. The patient had had no chill, nor chilly sensations, no nausea, nor vomiting. The intellect was good, although she was drowsy and tremulous.

The nasal mucous membrane was intensely congested; *no aural discharge;* left posterior superior meatal wall bulged downward, concealing subjacent structures. Over this area, exquisite sensitiveness on probing. Having recently read Whiting's classical article upon the subject (Trans. Sec. Lar. A.M.A. 1899), although this was the first case that I had encountered, I had no hesitancy in diagnosing sinus thrombosis and urging immediate operation. Owing to reluctance on the part of the family to accept operation and questioning of diagnosis on the part of one of the consultants. it was decided to employ continuous hot bichloride irrigations, 1-5000, and to await developments. The following morning, April 14th, the patient manifested no improvement in other respects, and the additional symptom of a suspicious seizure early that morning resembling a convulsion. The significance of this will be discussed later on. The family and consultants then agreed upon operation. The house being infected with scarlatina and under quarantine, considerable delay was occasioned in obtaining a permit to remove the patient. She entered the University Hospital the evening of April 14th, temperature 103.6°, pulse 112, leucocytosis 14,400. I performed the Koerner radical mastoid operation, assisted by Drs.

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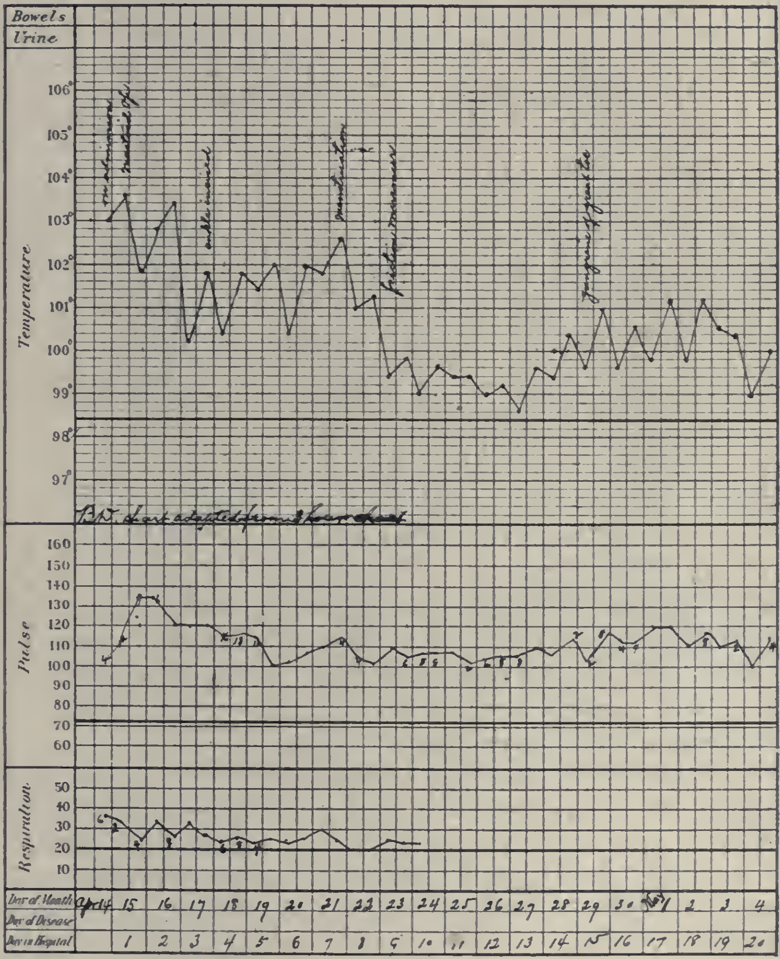
* Presented to the Southern Section of the American Laryngological, Rhinological and Otological Society, Baltimore, Md., Dec. 27 and 28, 1907.



Randolph Winslow and E. J. Bernstein, April 15th at 2.30 p. m. The bone was very dense, a few granulations were found in the antrum but no pus. The dura was exposed in several locations and looked healthy. The sigmoid sinus was exposed from above the knee to near the jugular bulb. Its walls felt thick like rubber, but pulsations could be distinctly felt. The sinus was slit open with a bistoury under control of compresses above and below, and the blood in it was found fluid. A wire curet was inserted into the lumen and small black clots removed (streptococci). The condition was then one of peripheral thrombosis. The circulation was freely established both above and below, ligation of the jugular was not deemed necessary, and the patient's condition rendered it inadvisable. The wound was firmly packed and owing to the exposed dura and other complications, was only partially closed by suture.

Following operation, the evening temperature fell to 101.8° and which decline continued steadily until the morning of the third day, when it was 100.2°. The first complication appeared on the evening of the fourth day when the temperature rose to 101.8° and the right ankle was incised and found to contain pus (arthritis); this contained streptococci. The temperature then remained between 101°and 102° until the seventh day, when a sudden rise to 103° was found to mark the onset of menstruation.

A rapid fall of temperature ensued, and on the tenth day it was 99°, at this period a friction murmur was heard over the left chest.

The temperature subsequently fluctuated between 99° and 100° until the evening of the fifteenth day, when a rise to 101° was found to announce a new complication, gangrene of the end of the left great toe. This was amputated.

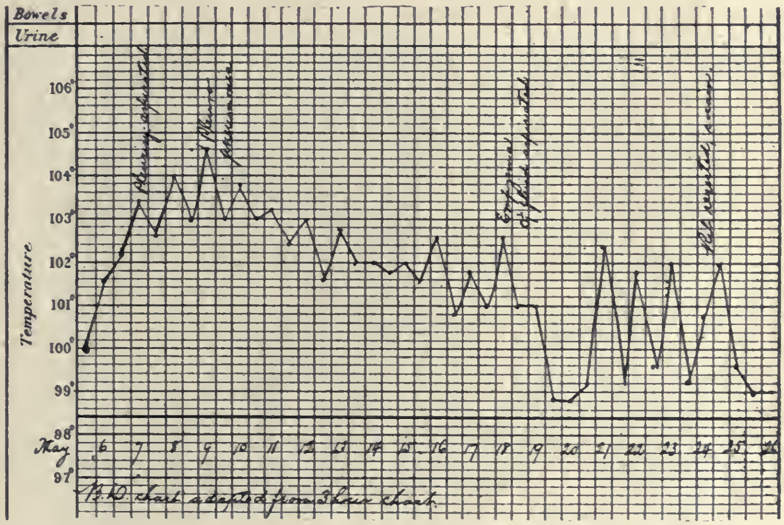
The temperature remained between 100° and 101° until the twenty-second day, when a gradual ascent began, which reached 103-4° on the twenty-third day. On this day the patient awakened with severe pain in the left side which was flat on percussion, and upon aspiration about one pint of serum was withdrawn from the left chest (Pleurisy). Following this a slight fall of temperature occurred, succeeded by a rapid rise to 104° on the evening of the twenty-fourth day.

On the afternoon of the twenty-fifth day, the temperature was 104.6°, pulse 160, leucocytosis 28,000. Dry cough appeared and persisted for many days thereafter as an harassing symptom.

A diagnosis of *septic pleuro-pneumonia* was made by the consultants, Drs. Randolph Winslow, Henry Hill and myself, and a fatal prognosis given. No one of us expected to find the patient alive the next morning.

Cold sponging was, however, instituted and stimulating hypodermic injections and enemata administered and to the tireless faithfulness and efficiency of the nurse, Miss M. Miller, now superintendent of nurses at the Presbyterian Eye, Ear and Throat Hospital, in carrying out these instructions, was largely due the salvation of the patient.

On the morning of the twenty-sixth day, the temperature was 103°, pulse 156, leucocytosis 36,000—this very gradually fell to 102.4° on the twenty-eighth day, and continued until the thirty-second day, when it began to fluctuate between 101° and 102°. On the thirty-fifth day about one pint of cloudy fluid was withdrawn from the chest by aspiration, which was found to contain pus cells and some streptococci (Empyema).



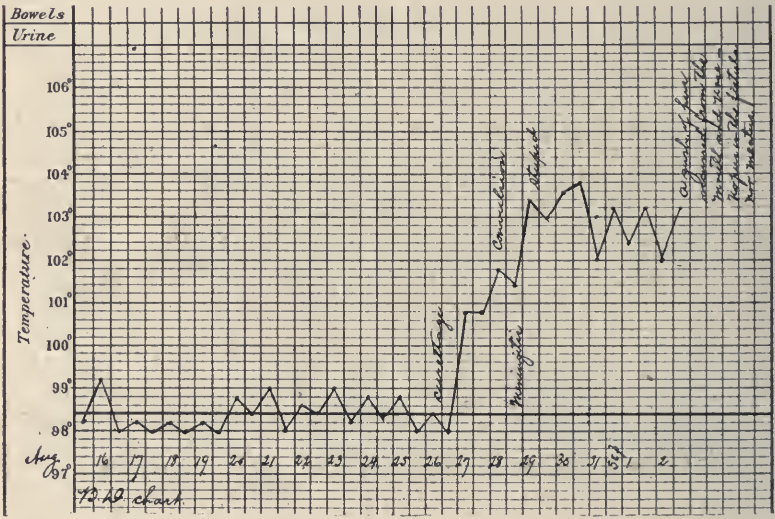
From the thirty-second to the forty-first day a typical septic chart was presented, varying from 99° to 103°. Cough was very troublesome. At this time, it was thought imperative to establish better drainage of the chest, and Dr. Randolph Winslow *resected one of the ribs* under cocaine, as the patient's condition did not admit of general anesthesia.

The temperature promptly dropped from 102° on the morning of the forty-first day, to 99° the following morning, remaining around this point until the forty-seventh day.

The temperature then began to oscillate, sometimes being as low as 99° and sometimes as high as 101.8°, without special incident, until the patient was discharged from the Hospital on the eighty-second day (July 5th).

During this period *obstipation* was a noteworthy symptom and repeated doses of calomel and purgatives had to be administered.

From July 5th until August 26th, the temperature and pulse were quite variable; the greater part of the time the temperature was approximately normal for considerable periods. The patient was going out of doors, and was in such good condition that I seized this opportunity of securing a week's vacation at the seashore.



A significant fact during this period was the sudden occurrence on several occasions of elevated temperature, at times reaching 103° without apparent reason. Preceding the final illness there had been a period of twelve days of approximately normal temperature (98° to 99°).

Wound healing had progressed favorably and the side wound was well.

The mastoid wound was reduced to a fistulous tract, not larger than a slate pencil and about 3-4 inch in depth. This had become so obstructed by exuberant granulations, as to prevent drainage; and I accordingly curetted it lightly under cocaine *mop,* with the customary aseptic precautions (Aug. 26th).

No exposed bone nor other complication was detected. The evening of the following day the temperature shot up to 100.8°, progressively rising to 104.8°, on the fifth day, and remaining around 103° until the fatal termination on the eighth day (Sept. 2nd).

During this period there were typical signs of meningeal irritation and on one occasion a convulsive seizure occurred. No pus was present in the wound nor in the meatus. At the time of death a gush of pus occurred from the *mouth* and from the *nose*.

Thus ended a heroic battle against death in many forms, during a period of four and a half months, and were blighted hopes of a surgical triumph. No autopsy could be obtained, but the fistula and the meatus were examined carefully and no pus found.

The following queries occurred to me at the time and have never been satisfactorily answered in my mind:

What was the exact cause of death?

What was the relation of the curettage to subsequent developments? As this was performed under strict aseptic conditions, how could reinfection occur? and even so, why should the phenomena of infection be manifested at so distant a point as the *anterior* cerebral regions?

Was a thrombus released? or were strepococci, already present in the wound, stirred up to increased virulence?

Was the association merely a co-incidence, and was there a latent brain abscess from the beginning? In this connection, what was the significance of the convulsiform seizures at the onset and the termination of the illness?

It should be here stated that I learned subsequently that the patient had told some friends, just before her fatal illness and while well enough to be out doors, that she "felt queer in her head just at the beginning of her sickness."

This case has been selected for presentation from among several subsequent more fortunate ones, on account of the following points of interest:

1. Classical symptoms and early diagnosis, in a condition of peripheral thrombus.

2. Multiform complications—purulent arthritis (toe and ankle) serous pleurisy, empyema (resection of rib), meningitis or brain abscess.

3. Desperate virulence of the infection (streptococci found in all fluids), so that during four and one half months the patient was never really free from sepsis.

4. Obscure cause of death.

114 West Franklin Street.

THE "VICIOUS CIRCLE" OF THE NOSE—THE RATIONALE OF SINUS INFLAMMATIONS AND THEIR TREATMENT.*

BY WILLIAM LINCOLN BALLENGER, M. D., CHICAGO, ILL.

A somewhat extended clinical experience, and a knowledge of the anatomical arrangement of the structures of the nose, together with a knowledge of well known laws regulating the predisposition of mucous-lined cavities to infection and inflammation, have led me to hold the opinion that a large percentage of the cases of sinuitis affecting the sinuses draining into the middle meatus of the nose, may be successfully treated by intranasal operative procedures. I am likewise convinced that, only in exceptional cases is it necessary to perform extranasal operations for the cure of infection and inflammation of this group of sinuses.

When we recall the fact that the frontal and maxillary sinuses are included in this group of cells, and that divers external operations have been advocated and practiced for the relief of infections and inflammations affecting them, my claims for intranasal surgery may at first thought appear to be too strongly stated. I trust, however, in this paper, to state the facts, as I have observed them in my practice, in such a way as to substantiate the premises herein stated.

The Vicious Circle of the Nose: The frontal, anterior ethmoidal and the maxillary sinuses have a common exit, namely, the hiatus semilunaris, for the discharge of their normal and diseased secretions. While this statement is open to certain exceptions, to be noted, it is, nevertheless, in the main true. The frontal sinus does not uniformly drain into the infundibulum, but according to Logan Turner it drains directly into the middle meatus of the nose in fifty per cent of the skulls examined by him. Nor do all the anterior ethmoidal cells drain into the infundibulum. The Bulla ethmoidalis and middle turbinal cells are exceptions. While the ostium maxillare always opens into the infundibulum, it by no means constitutes the only source of drainage for the antrum in a large number of subjucts. Turner found accessory maxillary ostia in four out of nine specimens examined by him, the accessory ostia being posterior and a little inferior to the posterior end of the hiatus semilunaris. With these exceptions the infundibulum and its ostium (the hiatus semilunaris) receives the secretions from the frontal, anterior ethmoidal and maxillary sinuses.

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*Read before the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., Sept. 26, 27, 28, 1907.

This being true, it is obvious that any condition, anatomical or pathological, causing obstruction to the flow of the secretions from the infundibulum via the hiatus semilunaris will interfere with the drainage and ventilation of one or all of this group of sinuses.

The well known law referring to the predisposition of mucous-lined cavaties to infection and inflammation may be stated as follows:

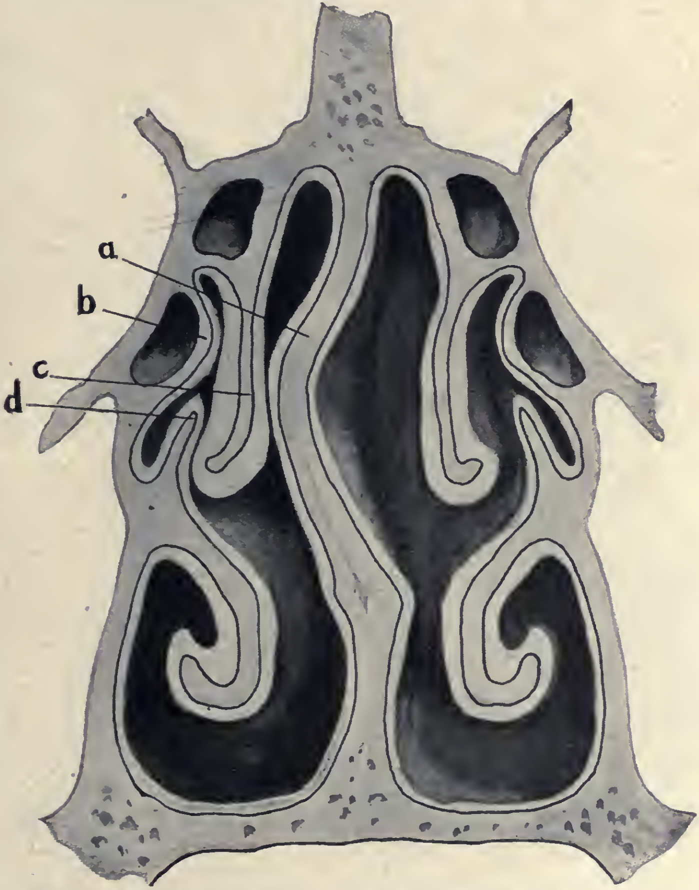

Fig. 1. A High deviation of the septum causing closure of the Infundibulum. (a) High deviation of the septum. (b) Inner wall of the bulla ethmoidalis. (c) Middle turbinal crowded against the outer wall of the nose and blocking the drainage of the infundibulum.

Any cavity lined with mucous membrane is predisposed to infection and inflammation when its drainage and ventilation are impaired.

In view of this law it is obvious, therefore, that any condition, anatomical or pathological, causing obstruction to the flow of the secretions from the infundibulum, via the hiatus semilunaris, will predispose the mucous membrane lining the sinuses draining into it, to infection and inflammation.

It is equally obvious that if the obstruction to the drainage and ventilation is removed, the predisposition to infection and inflammation will disappear. That is, whereas, the obstruction to the drainage and ventilation causes a lowered resistance of the tissues, the removal of the obstruction raises the resistance of the tissues, hence, the disappearance of the infection and inflammation.

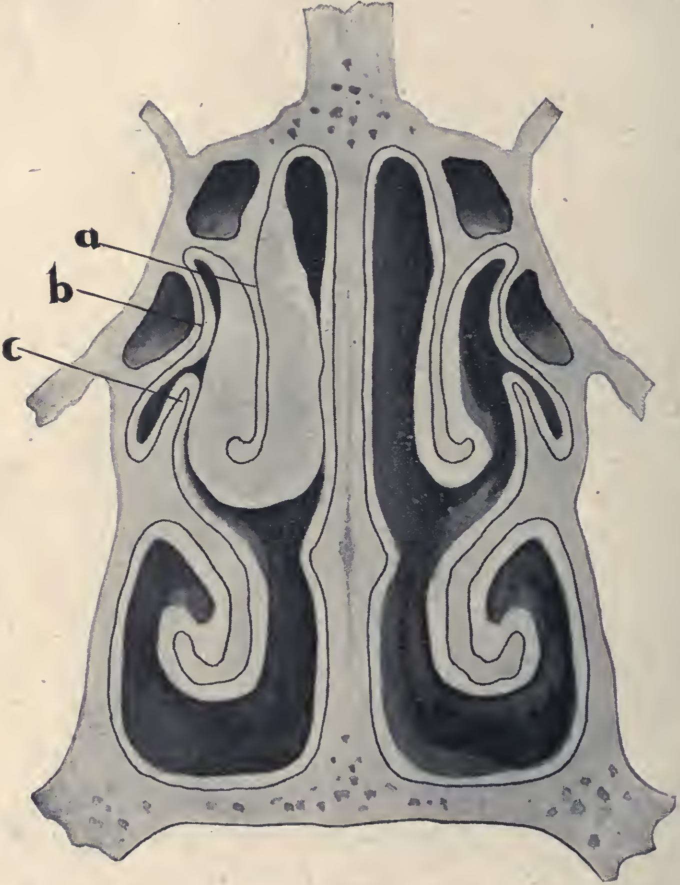

Fig. 2. Edema of the mucous membrane of the middle turbinal blocking the infundibulum.

The clinician may, with truth, say, that it is a condition that confronts him and not a theory. The question therefore, resolves itself into the query: "Does sinuitis affecting this group of cells tend to disappear when obstructive lesions are removed from the region of the infundibulum?" According to my experience it does, though there are important exceptions.

Having outlined the hypothetical aspect of the problem, it remains to present concrete data as to the actual results obtained by procedures instituted in consonance with the hypothetical statement. In order to make the clinical deductions more clear, additional anatomical data will first be given.

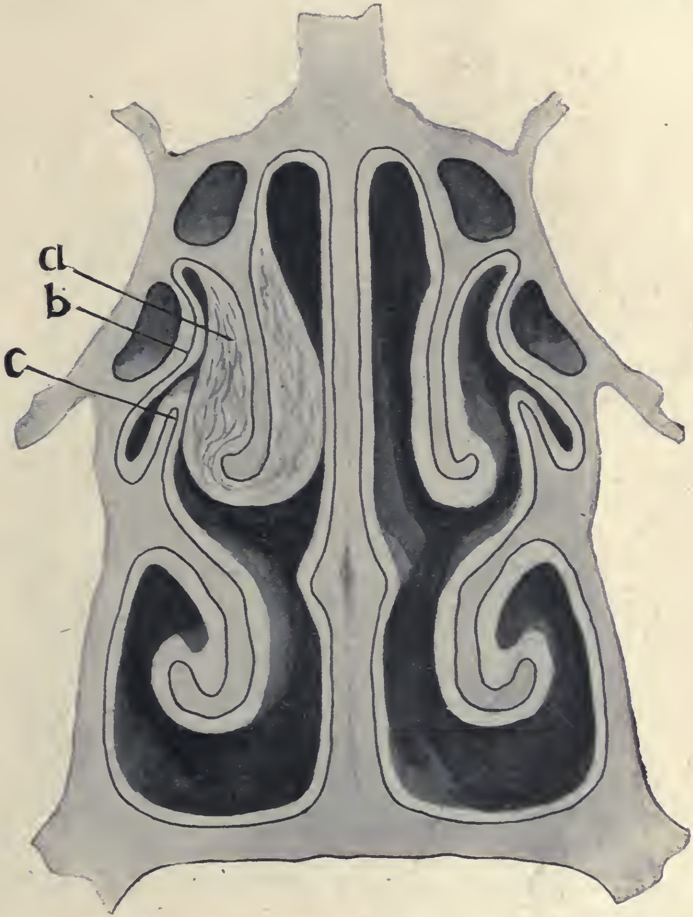

Fig. 3. Cross-section through the nose, (a) hyperplasia of the middle turbinated body which crowds the uncinate process, (c) closes the infundibulum.

(a) The nasal septum is frequently deviated towards the lateral wall of the nose in the region of the anterior half of the middle turbinated body, often crowding the middle turbinal against the outer wall of the nose (Fig. 1), thus obstructing the drainage and ventilation of the frontal, anterior ethmoidal and maxillary sinuses.

(b) The middle turbinated body is frequently enlarged by edema (Fig. 2) hyperplasia (Fig. 3), or by the presence of accessory ethmoidal cells in its body (Fig. 4), and may in consequence block the hiatus semilunaris; or the middle turbinal may cling so closely to the outer wall of the nose (Fig. 5) as to block the hiatus.

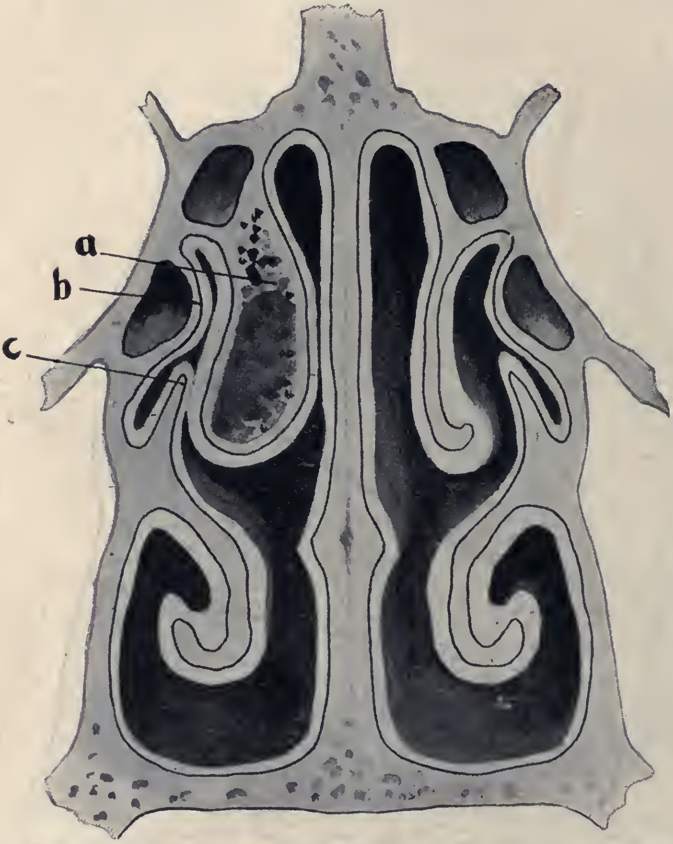

Fig. 4. A large cyst of the middle turbinated body occluding the infundibulum. (a) Cystic middle turbinal, (b) The inner wall of the bulla ethmoidalis, (c) The uncinate process or inner wall of the infundibulum or gutter.

(c) The bulla ethmoidalis is located immediately above the hiatus, and when enlarged it may overhang and completely obstruct it (Fig. 6).

(d) The lip of the uncinate process, or median wall of the infundibulum, mal be the seat of accessory pneumatic cells which may obstruct the infundibulum (Fig. 7).

The anatomical structures described above I am pleased to call the "Vicious Circle of the Nose." (Fig. 8.)

I do not use this expression because I wish to introduce a new terminology, but because I hope by it to emphasize the clinical importance of the various anatomical structures, embraced within its limits. I shall hereafter, in this paper, refer to the anatomical structures within this area as the "vicious circle" of the nose, because it is in this area, rather than in the sinuses, that we must look for the predisposing causes of the infection and inflammation. Finding the cause here, we should address our remedial measures to

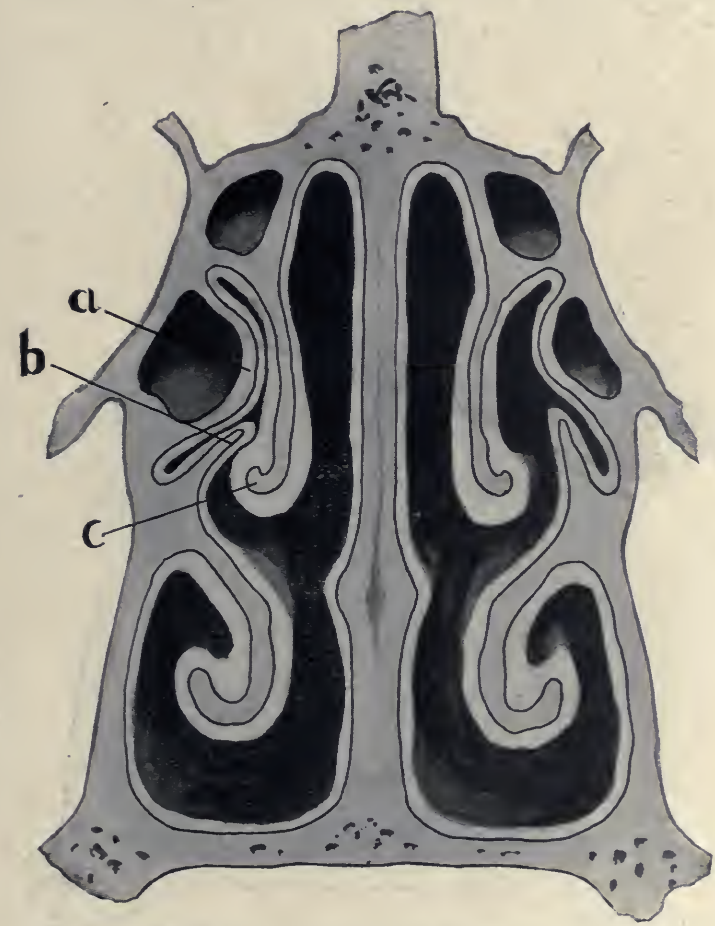

Fig. 5. Enlargement of the bulla ethmoidalis, blocking the infundibulum, (a) The inner and distended wall of the bulla ethmoidalis crowding inward and downward against the uncinate process and blocking the infundibulum, (b) The uncinate process, (c) The middle turbinal, which, on account of the bulging bulla, appears to be the cause of the blockage.

its removal. Should these efforts fail, more radical measures may be undertaken.

Clinical Data: From an anatomical view it has been shown that in simple sinuitis of the frontal, anterior ethmoidal, and the maxillary sinuses, all of which usually drain into the infundibulum, the obstruction to ventilation and drainage is often due to the malposition, or diseased condition of the structures in the vicinity of the infundibulum, rather than in the sinuses. This being true we should expect the removal of the obstruction in this region, the "vicious circle," to be followed by the relief or cure of the sinuitis. If the obstruction is located in the sinuses, or at their ostia, the removal of the structures of the "vicious circle" would not be followed by a

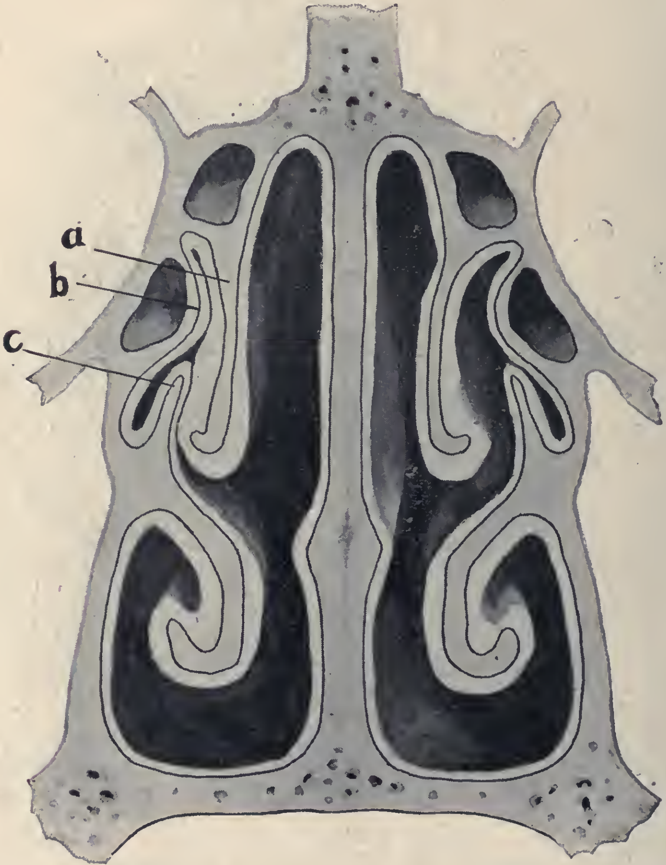

Fig. 6. The middle turbinated body clinging to the outer wall of the nose, and blocking the infundibulum.

relief or a cure of the sinuitis. Under such conditions it would be necessary to direct therepeutic measures to the sinuses, or to their ostia. My clincal observatons cover some two hundred operative cases for chronic sinuitis affecting the frontal and anterior ethmoidal sinuses, and in but five instances have I found it necessary to extend my operation beyond the "vicious circle" of the nose. The diagnosis in seventy-five of these cases were confirmed by skiagraphs, and in no instance was the skiagraphic findings at variance with the diagnosis previously made. I infer, therefore, that in the earlier one hundred and twenty-five cases my diagnoses were probably correct.

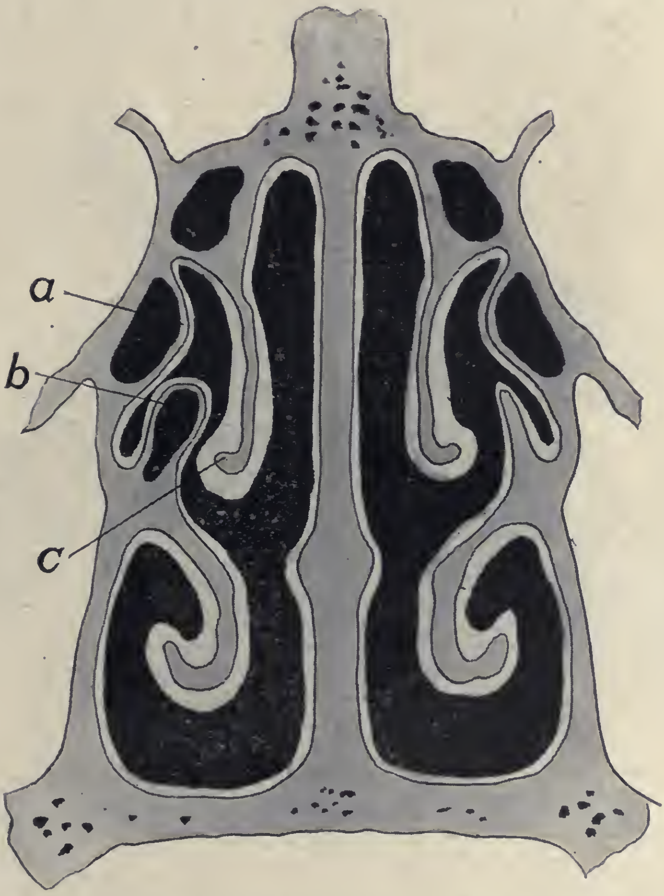

Fig. 7. Cyst of the uncinate process (b) blocking the infundibulum.

In view of these observations I may fairly conclude that a very large majority of the cases of inflammation of the frontal and anterior ethmoidal sinuses may be cured by limiting the treatment to the area of the "vicious circle" of the nose. While the percentage of cases thus apparently cured by me is ninety seven and one-half, I do not wish to go on record as claiming this to be a correct estimate of the effects of this mode of treatment. There are several reasons to be offered against the accuracy of such a conclusion.

In the first place, the number of cases (200) observed by me is too small to warrant an accurate statistical statement.

In the second place, the question of diagnosis must be taken into account. Many observers only diagnosticate sinuitis when the symptoms are very obvious, the presence of pus in the middle meatus of the nose, being the objective symptom most often depended upon. If only such cases are to be regarded as sinuitis it is obvious that a much smaller percentage would be cured by directing the therapeu-

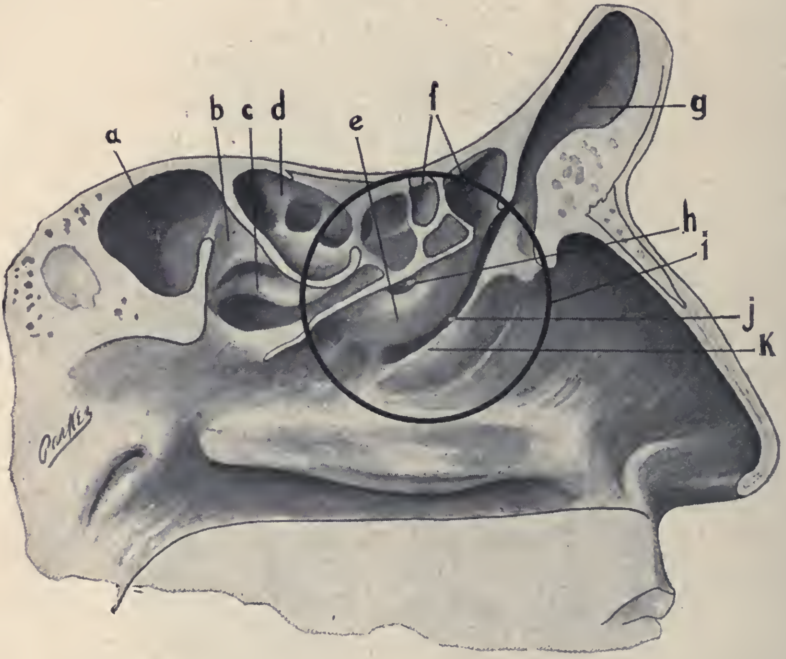

Fig. 8. Vicious Circle of the nose, the area which is often responsible for infection and inflammation of the frontal anterior ethmoidal and the maxillary sinus. (b) The sphenoidal sinus. The ethmo-sphenoid fossa. (c) The superior turbinated body. (d) Posterior ethmoidal cells. (f) Anterior ethmoidal cells draining into the fronto-nasal canal. (g) Frontal sinus. (h) The ostium of the bulla ethmoidalis. (i) Hiatus semilunaris. (k) The uncinate process or outer lip of the infundibulum or gutter on the outer wall of the nose into which the frontal, anterior ethmoidal and maxillary sinuses usually drain. The high light below and anterior to j and k indicates the inferior boundary of the infundibulum or gutter into which the sinuses drain. The middle turbinated body is removed to exhibit the anatomical details beneath it.

tic measures to the "vicious circle" of the nose. In some of these cases the disease is much further advanced, and the tissue changes more pronounced in the sinuses and around their ostia, hence, in addition to the blockage of the infundibulum, the blockage from the granulations, etc., in the sinuses and around their ostia must be taken into account in carrying out the therapeutic measures. Bone necrosis and intracranial complications also call for radical surgical treatment. All cases with obvious purulent discharge into the middle meatus of the nose do not, however, come under the complicated class; many of them being amenable to treatment directed to the structures of the "vicious circle." As previously stated, only five out of two hundred cases coming under my care required radical operative procedures, and in all of these I performed the Killian operation, four with brilliant results both as to a cure and external deformity, and one with an entirely negative result.

In my diagnosis, I have included some cases in which I could not see pus though the patients claimed they frequently blew it from the nose, especially in the early morning. They complained of frontal headache either unilateral or bilateral, usually more pronounced of mornings. They also complained of dizziness of short duration, which was aggravated upon stooping. The anterior end of the middle turbinated body was often enlarged, glazed, velvety in texture, and rested against the septum. In some instances the septum was bowed in the region of the middle turbinal and forced the turbinal against the outer wall of the nose, and thus prevented free ventilation and drainage of the sinuses draining into the infundibulum. In others the bulla ethmoidalis was enlarged and blocked the hiatus semilunaris. These findings, and the cloudiness of the frontal and ethmoidal cells upon the skiagraphic plate, led me to make the diagnosis of frontal and anterior ethmoidal sinuitis.

In cases thus diagnosed I believe that ninety per cent of them may be cured by addressing the treatment to the "vicious circle" of the nose, while the remaining ten per cent will require external operative procedures. Of the cases curable by limiting the treatment to the "vicious circle" of the nose, many are curable by non-surgical methods, as the local applications of adrenalin, cocain, a ten per cent glycerine solution of ichthyol, antipyrin, etc. Still others may be greatly benefitted by divulsing the middle turbinal away from the septum, or away from the outer wall of the nose, according to its point of impediment or obstruction. In the remaining cases it will be necessary either to remove the anterior half of the middle turbinal, break down the enlarged and overhanging bulla ethmoidalis, or even to exenterate the anterior ethmoidal cells as thoroughly as possible, and in rare instances to remove the floor of the frontal sinus by Halle's method. In those cases complicated by inflammation of the posterior ethmoidal and sphenoidal sinuses the surgical treatment should be extended to include them in its scope.

In conclusion, I wish to say that the object of this paper is to call attention to the fact that the obstructive lesion which interferes with the ventilation and drainage of the frontal, anterior ethmoidal, and maxillary sinuses is usually *not* located in the sinuses, or even in their ostia, but *is* in the hiatus semilunaris and infundibulum, or in the structures in their immediate vicinity. This being true the rational therepeutic indication is to remove the obstructive lesions from this region, the "vicious circle" of the nose, rather than to attack the sinuses themselves. In the smaller percentage of cases in which extensive tissue change has taken place, a radical external operation should be performed.

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Health and Development of School Children. GEO. L. LESLIE, M. A., (Los Angeles.) *South Calif. Practitioner.* Feb. 1907.

The author of this elaborate paper is not a physician. He is director of the Department of Science of the Los Angeles Schools. While the paper contains much that school teachers should know—too much for them to assimilate with their teaching duties—it is the elaborate and, in the reviewer's opinion, impracticableness of the whole article as regards the teacher, that marks it as the product of a layman.

To those teachers, however, who have the time and intelligence to master the multitude of details, and to some physicians, it has a high value. At the present time such an elaborate scheme of directions for teachers cannot equal in simplicity and practicability the instructions for the examination of school children's eyes and ears by Dr. Frank Allport of Chicago, which has won the confidence of the medical profession and boards of health and education throughout the country, and which has been made the foundation of compulsory laws in several States. EATON.

THE MANAGEMENT OF SUPPURATION OF THE MIDDLE EAR BASED ON AN ANALYSIS OF A SERIES OF 100 CONSECUTIVE CASES SEEN IN PRIVATE PRACTICE.*

BY W. SOHIER-BRYANT, A.M., M.D., NEW YORK.

Middle ear suppuration and its complications is a trite subject, but there is still a diversity of opinion as to its proper treatment. The importance of the affection is, I believe, sufficient justification for an analysis of cases, the results from which may aid the surgeon in the management of this disease. To this end, let us consider the history of these cases, the treatment used, the results following treatment, and draw therefrom what deductions we can.

ETIOLOGY—Age—The oldest patient was 77; the youngest 3 months; and the average 21 years. In detailed periods, the cases fall into the following category: Under 10 years, 22; 10 to 20 years, 16; 20 to 30 years, 26; 30 to 40 years, 22; 40 to 50 years, 9; 50 to 60 years, 3; 60 to 70 years, 1; 70 to 80 years, 1.

Sex—Fifty-five were males, and 45 were females. The largest number in any one year, 9 (during the first year.) The next largest number, 7 (in the twenty-sixth year.)

PREVIOUS HISTORY.—Nasal obstructions were considered the predisposing cause of the middle ear suppuration in forty-six cases. including three cases of misuse of the nasal douche. Only one case was thought to be superinduced by adenoid growth. There were two cases of infection from sea-breathing; from scarlet fever, one; tuberculosis, three; malignant growths, two; injury at birth, one; other trauma, one. Forty-five had no definitely assignable cause. The large number of cases due to nasal obstruction out of the total fifty-five cases where an assignable cause could be found is worthy of note; these were forty-six out of fifty-five, or 84%.

Two of the three cases of purulent otitis from nasal douching went on to mastoid involvement. Of these one was cured by operation, and one recovered without surgical interference. Thus 4% of the cases of mastoiditis were caused by the nasal douche, and three per cent of the operations for mastoiditis were necessitated by infection following the use of this dangerous procedure.

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* Read before the Twenty-ninth Annual Congress of the American Laryngological Association, Washington, D. C., May 7, 8 and 9, 1907.

Both ears were affected in 8%; there were twenty-one (21%) acute cases and seventy-nine (79%) chronic cases, including forty-five (45%) simple chronic cases; twenty-four (24%) perennial cases which had suppurated continuously for over ten years; and ten (10%) cases of recurrent suppuration.

We find among the acute cases that four cases out of every five were complicated, that is sixteen (76%) out of the twenty-one acute cases.

Among the chronic cases, nine out of every eleven were complicated, that is forty-seven (59%) out of the seventy-nine cases.

Among the simple chronic cases, thirty-four (75%) out of forty-five cases were complicated. Among the perennial cases, eight (33%) out of twenty-four were complicated.

Among the recurrent cases, one out of every two cases was complicated, that is five (50%) out of ten cases.

There were eight cases of intracranial complication, including one cerebellar and cerebral abscess, epidural abscess, perisinus abscess, pachymeningitis, thrombosis of sigmoid sinus, with thrombosis of internal jugular vein; three cases of thrombosis of sigmoid sinus, including the perisinus case; five cases of epidural abscess of the perisinus variety with pachymeningitis and mastoiditis; one case of leptomeningitis with jugular thrombosis.

Mastoiditis was a complication in 51 cases; 81% of all the complicated cases had mastoiditis.

The 51 cases of mastoiditis include fifteen with complicated acute middle ear suppuration. Fifteen out of the sixteen of the acute complicated cases had mastoiditis; that is 94%. The balance of the mastoid cases, thirty-six in number, occurred during chronic middle ear suppuration. These 36 make up 77% of the complicated chronic cases.

DEFINITIONS.

The adjective *healed* is used in this article to denote all cessation of exudation and the final closure of sinuses and epidermization of surfaces.

Normal hearing denotes hearing above what might reasonably be expected in the healthy individual.

Simple chronic suppuration denotes suppuration which has passed beyond the acute stage, but has not lasted ten years.

Perennial suppuration has lasted over ten years.

MASTOIDITIS.

	Cases.	Per cent of 51 cases.
Acute	15	29%
Chronic	36	71%
Total	51	100%

Ninety-four percent of all the acute complicated cases.
Seventy-seven per cent of all the chronic complicated cases.
Seventy-one per cent of all the acute cases.
Forty-six per cent of all the chronic cases.
Eighty-one per cent of all the complicated cases (acute and chronic).

	Cases.	Per cent of all cases.
Simple chronic	30	59%
Perennial	4	8%
Recurrent	2	4%
Total chronic cases of mastoiditis	36	

Eighty per cent of the complicated simple chronic cases.
Fifty per cent of the complicated perennial cases.
Forty per cent of the complicated recurrent cases.
Sixty-six per cent of the simple chronic cases.
Twenty-three per cent of the perennial cases.
Twenty per cent of the recurrent cases.

The other complications were three malignant growths (one intracranial); five cases of caries, including one with mastoiditis; one case of spontaneous denudation of the dura mater with caries; one cholesteatome; five cases of epitympanic inflammation and perforation of Shrapnell's membrane, including one with mastoiditis and one with caries; tuberculosis, three cases; diabetes, one case.

Hearing Condition: The hearing before the commencement of treatment was largely deficient in all the cases, but none were absolutely deaf. No labyrinthine suppuration was observed.

Operative Treatment: Of the 37 mastoid operations performed, 8 were for acute middle ear suppuration and 28 for chronic. Of the 28 chronic, 9 were tympanomastoid excenterations or radical operations. One was a case of cerebral and cerebellar abscess with sinus and jugular thrombosis complicating chronic suppuration, treated by extensive exposure and drainage; the jugular was ligated, split and packed. There was one case of sigmoid sinus thrombosis, which was opened after ligating, and after the jugular was excised. This operation was secondary to a simple mastoid operation (not the author's), for mastoiditis complicating acute otorrhoea.

THE 36 CASES OPERATED ON FOR MASTOIDITIS WERE ALL URGENT CASES.

Acute cases, 8; 38% of all the acute cases; 50% of all the acute complicated cases. Chronic cases, 28; 36% of all the chronic cases; 44% of all the chronic complicated cases. Total cases, 36.

Simple chronic cases, 24; 53% of all the simple chronic cases; 71% of all the simple chronic complicated cases. Perennial cases, 3; 13% of all the perennial cases, 37% of all the perennial cases. Recurrent cases, 1; 10% of all the recurrent cases; 20% of all the recurring complicated cases. Total cases, 28.

Acute cases, 8; 8% of the total 100; 22% of the 36 operated cases. Chronic cases, 28; 28% of the total 100; 78% of the 36 operated cases. Total cases, 36.

Simple chronic cases, 24; 24% of the total 100; 67% of the 36 operated cases. Perennial cases, 3; 3% of the total 100; 8% of the 36 operated cases. Recurrent cases, 1; 1% of the total 100; 3% of the 36 operated cases. Total cases, 28.

SUMMARY OF THE AGES OF THE PATIENTS OPERATED ON FOR MASTOIDITIS.

There were seven (19%) under one year; twenty-one (58%) under ten years. The largest number next to the first year of life was in the fourth and sixteenth years, four cases each.

There were thirteen tympanomastoid excenterations; nine for extensive acute osteitis, and four for chronic purulent otitis media at the choice of the patient who would not wait for the cleansing treatment.

There were four uncomplicated cases operated upon for suppuration. These were all chronic suppurative cases. There were nine tympanomastoid excenterations demanded by acute otitis; of these six (66%) were in simple chronic middle ear suppuration; two (22%) in perennial suppuration, and 12% were in recurrent suppuration.

There was one ossiculectomy and tympanic curettage for caries of the tympanum and chronic suppuration.

The three malignant cases were treated by local excision, except the epithelioma, which had three X-ray exposures.

Convalescence of the intracranial cases was as follows: 1 cerebellar and cerebral abscess, epidural abscess, perisinus abscess, thrombosis of sigmoid sinus with thrombosis of internal jugular vein, recovered from the serious condition in 12 days, and final convalescence was complete in 49 days. Two cases of thrombosis of the sigmoid sinus recovered completely in twenty-three days. One subsequently died. Five cases of epidural abscess of the perisinus variety with pachymeningitis and mastoiditis recovered completely in 16 days on the average; longest, 27 days; shortest, 6 days.

There were 22 non-complicated mastoid operations with average length of healing 13 days; longest, 28 days; shortest, 4 days. Of the 22, there were 16 in simple chronic; average time of healing, 11½ days; longest, 28 days, shortest, 4 days. Of the 22, there were 6 cases of acute suppuration; average time of healing, 20½ days; longest, 28 days; shortest, 7 days.

The average period of convalescence of the mastoid operations in the cases of acute suppurative otitis media was 9 days longer than in the chronic—that is, the convalescence of the operations in acute suppurative cases was 82% longer or nearly twice as long as in the chronic suppurative cases.

The average time of complete healing of the thirteen cases of radical operation was 25 days; longest, 56; shortest, 8. The nine cases with acute osteitis had an average healing period of twenty days; longest, thirty-nine; shortest, eight days; five of them were in simple chronic cases; three in perennial, and one in recurrent suppuration. The four simple chronic suppurative otitis media cases averaged thirty-four days; longest, fifty-six days; shortest, nineteen days. Convalescence was complete in four months in the only case of ossiculectomy and curettage of tympanic caries.

There were three cases of malignant disease of the ear, two of the auricle and one of the tympanum, all associated with chronic otorrhœa. The results following treatment were: One recovery from epithelioma of auricle after three exposures of the X-ray; one recurrence in the stump and death after removal of the auricle for epithelioma; one case of endothelioma of the tympanum and cranium treated by surgical removal of the tympanum and exposure to radium.

The non-operative treatment of the suppuration was followed by complete healing in 15 cases of mastoiditis, in the case of diabetes, in the cholesteatoma and several others, and in all the non-complicated cases. The only exceptions were in two cases of tuberculous infection. The treatment used was what I call 'the cleansing treatment."

Of the total fifty-one cases of mastoiditis, thirty-six were operated upon; fifteen were not. Of these 15, 7 were cases of acute middle ear suppuration and 8 were chronic; 7 simple chronic and 1 recurrent. 15 cases of mastoiditis recovered without operation, 30% of the 51 mastoiditis cases.

Acute, 8; 53% of the cases of acute suppuration with mastoiditis. Simple chronic, 5; 16% of the cases of simple chronic suppuration with mastoiditis. Perennial, 1; 25% of the cases of perennial suppuration with mastoiditis. Recurrent, 1; 50% of the cases of recurrent suppuration with mastoiditis. Total, 15.

There was one case of double mastoiditis not operated on. One ear had acute suppuration; the other, chronic. Thirty-three of the non-complicated cases were treated by the cleansing method also.

The convalescence following the cleansing treatment of five cases of attic inflammation and perforation of Shrapnell's membrane was complete. In one case, after 2 days; one after 90 days in spite of caries; one after 21 days; one after 10 days, and one after 3 days; average, 25 days. Three cases of tuberculosis; 1 convalesced in 19 days; two did not heal. One with diabetes was finally healed after 18 days of treatment.

This was a case of chronic recurrent purulent otitis. One cholesteatome in 10 months; 5 of caries, 1 in 90 days; 2 radical operations, 16 and 21 days convalescence respectively, to final recovery; 1 in 14 days; 1 curetting and ossiculectomy, four months.

Figures on the convalescence of the 37 non-complicated cases; 5 acute and 32 chronic. Four of the chronic cases had radical operations, leaving 33 cases not operated upon, 28 of them chronic. In the 28 chronic cases, the average time of healing was 11 days; longest, 56 days; shortest, 1 day.

Among the chronic cases there were eight simple chronic cases not operated upon with an average convalescence period of 13½ days; longest, 42 days; shortest, 1 day. Five recurrent with an average of 4 $^1/_5$ days; longest, 9 days; shortest, 2 days. The five acute cases had an average of 8½ days; longest, 12 days; shortest, 5 days. The recurrent did best, next the acute cases, then the perennial cases, and worst of all the simple chronic.

Twenty-four of the complicated cases were cured without a mastoid operation and 35 after a mastoid operation.

The final results in the 96 cases, or 96%, was complete convalescence and cessation of the suppuration and absence of all signs of inflammation and complete epidermization of all exposed surfaces after the length of treatment stated. No recurrence has occurred. The prevention of recurrence of otitis media purulenta when there is an open perforation of the drum membrane remaining, requires the patient to consult an otologist at regular intervals varying with the naso-pharyngeal conditions in order to have collections of epithelium, etc., removed from the tympanum. The shortest period since cessation of suppuration is nine months. Four cases, or 4%, of the cases were not cured of suppuration; 2, or half of them, were tuberculous and continue to have recurrence of suppuration at intervals. Of the other two, one died of sepsis, due to the encapsulated streptococcus with sinus thrombosis and meningitis, and one died of carcinoma. The death rate in the final result was 2%; one of sepsis and one of malignant disease.

All the cases seen because complications developed became healed under cleansing treatment without further trouble except the four radical cases. Twenty-two or 35% of the complicated cases also healed up under this treatment.

There were 63 complicated cases of which 37 had some kind of mastoid operation performed; 26 did not. Subtracting the 2 tuberculous cases not healed, there are 24 left, which means that 24% of the 100 and 38% of the 63 complicated cases were cured without serious operation.

The case of endothelioma is considered cured from an olotogical standpoint, because the endothelioma did not recur in or about the ear after a tympanomastoid excenteration and the use of radium. Death was due to mediastinal causes.

The case of sepsis with meningitis and thrombosis of the lateral sinus (a child) died two days after the mastoid operation, due to the encapsulated streptococcus.

Hearing: In the 73 cases observed the results of treatment were: decreased hearing after a radical operation for uncomplicated chronic suppuration, 1 case; no change, 13; improved, 59. The hearing changes are noted by comparing the hearing before the commencement of treatment with the hearing subsequent to treatment.

There was improvement in 59 of the 73 observed cases, or 80%; decrease in 2%; no change in 18%. In the 59 improved, there were 17% restored to perfect hearing, over normal; 23% of the observed cases had the hearing restored to normal; 53 per cent, or 9, of these were in acute suppuration. All but one of the nine, which was not complicated and was cured in five days, had mastoiditis. Four were operated on with an average time of healing of 19 days. Four were not operated on and had an average time of convalescence of 17 days. Five, or 29%, were in the simple chronic form of suppuration; 1 was not complicated (49 days); 1 with attic inflammation (90 days); 3 with mastoiditis. Of these, two were not operated on, (2 days and 5 days respectively). The other had extensive removal of bone for mastoritsi and epidural abscess followed by recovery in six days. There were 2, or 12%, of the cases restored to normal hearing among the perennial suppurative cases. They were uncomplicated and convalesced in one and two days respectively. One, or 6%, was in recurrent suppuration with acute mastoiditis; operation —modified radical—convalescence complete in 10 days. The average age of patients restored to perfect hearing was 29 years; oldest 77; youngest 12 years.

The remaining 42 cases showing improvement in hearing were: Acute 8, simple chronic 16; perennial 13; recurrent 5; total 42. Of the 8 acute, 3 were not complicated and convalesced in 8, 9 and 9 days respectively; 5 had mastoiditis; 2 were operated on and convalescence took place in 15 and 17 days; 3 were not operated on—convalescence in 6, 10 and 14 days. Of the 16 simple chronic, 6 were not complicated; 1 in 35 days; 1 in 1 day; 1 in 12 days; 1 in 3 days; 1 in 19 days (radical operation); 1 in 28 days (radical operation).

Of the 10 complicated cases, one with caries was treated by ossiculectomy and curettage and healed in 120 days; 1 brain abscess, etc., in 49 days; 8 had mastoiditis; 6 were operated upon—four mastoids with healing in 10, 12, 16 and 18 days respectively, average 14 days; radical operations with healing in 12 and 16 days. Two were not operated on and healed in 12 and 56 days respectively.

Of the 13 perennial cases with improved hearing, 11 were not complicated; 2 healed in 10 days; 1, in 8 days; 1, in 9 days; 2, in 2 days; 1, in 6 days; 1, in 21 days; 1, in 4 days; 1, in 18 days; and 1, in 5 days; two were complicated, 1 mastoiditis, 10 days, 1 cholesteatoma, 10 months. There was no operation in either case. Of the 5 recurrent cases, 3 were not complicated, and convalescence took place at the end of three days in each case. Two were complicated, 1 perforation of Shrapnell's membrane and attic inflammation, with convalescence in 21 days; 1 mastoiditis and radical operation with convalescence in 27 days.

Among the cases of improved hearing, there were 5 radical operations, 2 of them for uncomplicated otorrhoea; 1 brain abscess, etc.; 6 mastoid operations; 6 cases of mastoiditis not operated upon; 1 case of sinus thrombosis.

Of the 21 acute cases in our series of 100, 5 were non-complicated—1 normal hearing—and 16 complicated (mastoiditis). Of these, 8 regained normal hearing, divided among 4 operated upon and 4 not operated upon. The proportion of normal hearing following mastoiditis with acute suppuration of the middle ear is greater than in the non-complicated cases of acute suppuration; 50% of the complicated and 20% of the non-complicated recovered; 50% of these cases of mastoiritis recovered perfect hearing; half were operated upon and half were not operated upon.

Of the 45 simple chronic, 11 were non-complicated, with normal hearing in 2 of them; 34 were complicated. Of these, 3 had normal hearing and 2 mastoiditis, upon one of which an operation was done. In the simple chronic, 11% regained normal hearing, 9% of the non-complicated and 12% of the complicated mastoid cases; 10% of the mastoid cases; 4% of the operated mastoid cases and 40% of the not operated cases. Of the 24 perennial, 8 were complicated and 16 non-complicated. Of these 2 regained normal hearing. In the perennial, 8% regained normal hearing; 12% of the non-complicated.

Of the 10 recurrent, 3 were complicated and 5 non-complicated. One regained normal hearing after acute mastoiditis and modified radical operation. In the recurrent, 10% regained normal hearing; these were 33% of the complicated; 50% of mastoiditis cases, and 50% of operated cases for mastoiditis.

Fourteen per cent of the operated cases had good hearing (normal); 40% of the non-operated mastoid cases recovered good hearing (normal); 10% of the non-complicated got normal hearing.

There were 13 cases without any noticeable change in hearing after the permanent cure; 2 acute; 3 simple chronic; 8 perennials. Of the 2 acute, 1 had tuberculosis, 19 days; 1 had extensive osteomyelitis and extensive mastoid operation, 28 days. Of the 3 simple chronic, 1 was not complicated, 35 days; 1 had mastoiditis and a radical operation, 28 days; and one had tuberculosis of the ear and did not recover. Of the 8 perennial cases, there were 3 with no complications and convalescense took place in 4, 14 and 21 days respectively; 1 radical operation, 56 days (the longest); 1 mastoiditis (radical operation) 28 days; 1 mastoiditis, epidural abscess, radical operation, 21 days; 1 caries of tympanum, 14 days; and 1 of malignant disease, death.

Among the 13 cases, there was one extensive mastoid operation and four radical operations.

Summary: We find the sexes nearly equally divided in our series. The ages of the patients cover a wide range; the youngest 3 months, the oldest 77 years. The greatest number in any one year, nine, occurred in the first year of life; the next largest number in the twenty-seventh year. From this we may deduce that the first year of life is especially productive of serious suppurative ear disturbances. The

ANALYSIS OF 100 CONSECUTIVE PRIVATE CASES OF MIDDLE EAR SUPPURATION.

	Non-Complicated			Complicated			Mastoiditis			Operation			Final Result		Aver age Period of Convalescence in days	Hearing after convalescence				
	Cases	Per Cent of	Per cent of non-complicated	Cases	Per Cent	Per Cent of Complicated	Cases	Not Operated	Operated	Simple Mastoid	Complicated Mastoid	Radical Mastoid	Cured	Not Cured		Improved	Worse	x Normal Hearing	Unchanged	Not Noted Condition
ACUTE (21)	5	13	24*	16	25	76*	16	8	8	6	2	0	21	....	13	17	....	9	2	2
CHRONIC (79)..........	32	87	41§	47	75	59§	35	7	28	16	12	13	75	4	22	42	1	8	11	25
Total (100)..........	37	....	....	63	....	....	51	15	36	22	14	13	96	4	20	59	1	17	13	27
SIMPLE CHRONIC (45).	11	34	24†	34	72	76†	29	5	24	17	1	5	42	3	21	20	1	5	3	21
PERENNIAL (24).......	16	50	67‡	8	17	33‡	4	1	3	1	2	1	23	1	30	15	....	2	8	1
RECURRENT (10).......	5	16	50°	5	11	50°	2	1	1	0	0	1	10	....	6½	6	....	1	0	4
Total (79)..........	32	....	....	47	....	....	35	7	28	18	3	7	75	4	22	41	1	8	11	26

* Of Acute. § Of Chronic.. † Of Simple Chronic. ‡ Of Perennial. ° Of Recurrent.

etiology shows us the importance of nasal obstructions in determining ear suppuration. These were present in 84% of the cases. The nasal douche was the exciting cause of suppuration in 5% of the cases.

We note first the large pencentage (63%) of complicated cases, which suggests that the cases were delayed too long before receiving special treatment.

We further note that the complications are most frequent in the acute and simple chronic cases, and decrease as the chronicity of the affection increases.

We see further that an ear in the stage of simple chronic suppuration is just as likely to be complicated as one in the acute stage; while one in the perennial or recurrent stage is less likely to be complicated than in the acute or simple chronic stage, and least likely of all to be complicated when in the perennial stage. In other words, the dangers are most imminent in the simple chronic and acute stages and decrease with the increase in chronicity.

There were 8 cases of intracranial complication; 5 cases of epidural abscess of the perisinus variety; 3 cases of sinus thrombosis and one case of cerebral and cerebellar abscess included in the three cases of thrombosis.

Mastoiditis appears as the most common complication, occurring in 51 cases, or 81% of the 63 complicated cases. The large proportion of 51% of mastoiditis suggests what appeared to be a sad fact; namely, that the cases had been sent to the writer only as a last resort. All but two cases of the 100 had been treated by other practitioners.

The proportion of mastoiditis is largest in acute suppuration, where it formed 94% of the complications. In the chronic cases it formed 77% of the complications. As the chronicity increases the frequency of mastoiditis decreases. In the recurrent cases of suppuration only 4% are complicated, and in the perennial 8%. From this it is evident that a long standing case of otorrhoea is proportionately harmless.

There were five cases of malignant disease of the ear with suppuration; two of them involved the tympanum, one endothelioma and one carcinoma; one involved the pinna only, an epithelioma.

Hearing was largely deficient in all the cases before the commencement of treatment.

It would seem that the cases which demanded operation when first seen might have avoided the crisis if treatment could have been begun earlier. No case became complicated after the commencement of treatment.

There was one extensive exploration and drainage of the temporo-sphenoidal lobe and cerebellum; two ligations of the jugular vein, and 40 operations on the mastoid region including 13 radical operations, four of them for uncomplicated chronic suppurations. Two of the malignant growths were excised and one exposed to the X-ray. One case of curettage and ossiculectomy.

The case of brain abscess was absolutely healed in 49 days; one case of sinus thrombosis in 23 days; 5 cases of epidural abscess, average time to absolute healing 16 days. Average healing period of the 22 non-complicated mastoid operations, 13 days. Sixteen of them were in simple chronic suppuration, average time of healing 11½ days. The average time of the acute cases (6) was 20½ days.

The four cases on which a tympanomastoid operation was done for chronic non-complicated middle ear suppuration show an average duration of healing time, 34 days, which does not compare favorably with the duration of the healing period of the 28 chronic cases treated by the cleansing method, which averaged 11 days, or two-thirds less time.

Fifteen of the 51 cases of mastoiditis were not operated on, but were treated by the cleansing method. All the 37 non-complicated cases of otorrhoea were treated in the same way, except four, which had the radical mastoid operation performed. Fifty-five cases in all were treated by the cleansing method, all the 34 non-complicated cases and 21 complicated cases.

The average time of perfect convalescence in the five cases of attic suppuration and perforation of Shrapnell's membrane was 25 days; 1 tuberculous healed in 19 days; 1 diabetic healed in 18 days; 1 case of cholesteatoma in 10 months. The 33 uncomplicated cases healed by the cleansing method had an average healing time of 10 days. The recurrent cases did best with an average of 4½ days; worst of all were the simple chronic cases, with an average of 13½ days.

The final result of the operative and cleansing treatment was a complete convalescence from the suppuration in 96 cases without any recurrence. All the cases submitted to the cleansing treatment recovered without operation, except one which had extensive caries and did not heal until an ossiculectomy and curettage were performed. This was the only case of ossiculectomy for chronic middle ear suppuration.

The treatment of the malignant cases resulted in 1 cure; 1 local cure, but death from metastasis; 1 death from recurrence about the ear. In four cases the treatment failed; 2 cases of tuberculosis continued to suppurate in spite of the cleansing treatment.

There was one death from malignant disease, and one from sepsis and meningitis in spite of operation. This case was very far gone in general septic intoxication when she first came into our hands. The mastoid operation was performed immediately.

Our results in the three cases of malignant diseases suggest a good prognosis when the malignant cases are taken in hand early. Out of the three cases, two had no recurrence in the ear. Of these, one was entirely cured. Without operative interference, all the cases of intracranial complications would have ended fatally, giving a mortality of 8% in our total 100 cases, and 100% of fatalities in intracranial complications.

Not including the above, there were 28 operations for mastoiditis. Among these there were 7 cases of very extensive involvement of the bone which would probably have ended fatally from jugular thrombosis and general sepsis, making our probably fatal cases, if untreated, 15% of our 100 cases. Of the balance, 21, over one-half, might have been fatal if not operated upon, say 11 cases, making a total of 26 probably fatal cases, or 26% of the grand total.

This would give a probable death rate of 26% from suppurative ear disease when not treated. Our fatal septic case would undoubtedly have recovered if the operation had been performed before the general system had given way before the septic invasion, making the rate only 0 under early operative conditions.

Note the dangers concomitant with otitis media purulenta: Death 26%; mastoiditis 51%; partial loss of hearing without treatment 100%.

We see that the greatest proportion of normal hearing follows the convalescence from acute suppuration. Forty-three per cent of this class recover their hearing entirely.

The hearing following mastoid operations averaged more improvement than after the cleansing method. Also the hearing was found to be better following the suppuration when complicated by mastoiditis than when not so complicated.

The single case of decreased hearing was in a non-complicated case of chronic suppuration after the radical operation.

Seventeen cases or 23% of the observed cases recovered and have normal hearing; 80% were improved; 2% made worse, 18% unchanged.

The best hearing after the performance of the various mastoid operations was found in the case with the shortest period of convalescence.

CONCLUSIONS.

1. Purulent otitis media appears to be without danger if treatment is commenced before complications arise. In case complications have arisen the prognosis is still excellent if the cases are taken in hand at once, but with inadequate treatment the prognosis is extremely bad, inasmuch as there is a fatality of 26%.

2. A mastoid operation is not a menace to hearing, but a safeguard and gives the best post-operative ultimate results. The radical mastoid operation is not a menace when performed in complicated cases of otorrhoea and should increase the hearing.

3. The average period of convalescence is shorter by the cleansing than by the operative method.

4. The radical mastoid operation is contraindicated in cases of non-complicated otorrhoea.

5. Mastoiditis with middle ear suppuration gives better hope of the hearing than if there is no marked complication.

6. No noticeable scar or deformity follows any form of mastoid operation, when properly performed.

7. Cleansing treatment insures against the appearance of complications in all varieties of middle ear suppuration.

8. The results of treatment of suppurative otitis media compare very favorably with the results following treatment of the dry form of otitis media.

57 West Fifty-third street.

PRESIDENT'S ANNUAL ADDRESS, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY.

BY WENDELL C. PHILLIPS, M. D., NEW YORK.

For the thirteenth time, in annual conclave assembled, we are about to fulfill the purposes contemplated by the founders of our Society as outlined in our Constitution, as follows:

"The object of this Society shall be: the promotion of the science and art of medicine, especially in its relation to laryngology, rhinology and otology; the development of its members in original scientific work and the promotion of social intercourse."

Today, therefore, in larger numbers than ever before in our history, hailing from Maine to California, from the Provinces north of us to the Lone Star State in the South, and with hands across the sea in touch with honored co-workers of other lands, we are to join in presenting the results of our ripe experience, patient research and painstaking observation, and with friendly debate and kindly criticism to so emphasize and crystalize the truth that not only our own labors shall be set upon a higher plane, but through our published transactions the world of Laryngology, Rhinology and Otology may be aided in the monumental search for truth.

The three nations especially represented here to-day, friendly as they are in all their relations, and particularly so in matters pertaining to science, are far in the vanguard in achievements in the specialties which we have the honor to practice. Indeed, so friendly are their relations, both national and scientific, that with one accord, with a single bumper, and in the same breath, we may give utterance to the national salutations, "Hoch der Kaiser," "God Save the King," and, in our more youthful American enthusiasm, "Hurrah for Teddy Roosevelt!"

Among the pleasures associated with the presidential office is that of extending a cordial greeting to the members and guests who honor us by their presence upon this occasion, and on behalf of the members residing in New York and vicinity I give you the hand of welcome to our city, and also to this notable building which has been dedicated to the science of medicine and surgery.

The New York Academy of Medicine, with its active membership of one thousand, with its thirteen sections, each holding monthly meetings, supplemented by bi-monthly general meetings, and with the second largest medical library in America, opening wide

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* Read before the Thirteenth Annual Meeting of the American Laryngological, Rhinological and Otological Society, New York City, May 30, 31, and June 1, 1907.

its doors to all national societies free of charge, is a monument to medicine of which all New York physicians are justly proud.

My worthy predecessors in this honored office, aided by councils composed of our ablest men, have conducted our affairs with marked wisdom, safeguarding our membership, outlining our scientific programs, and exercising a wise watch-care over our transactions, with the result that in a few short years we have reached an enviable position among our national medical bodies.

It has been my pleasure to be present at all the national meetings, and to be officially connected with the Society from its inception. This relationship, continued by your pleasure, has enabled me to closely watch our growth. The duties have been made pleasant and the burdens light as a result of the cordial support, friendly greetings and kindly encouragement of the entire membership, and whenever the years of the decline shall come, as come they must, not the least among my reminiscences will be the great pleasure derived from your confidence and friendship in desiring me to remain so long in an official relationship, which has finally resulted in the bestowal of the highest honor in your power to confer. Need I say more of my appreciation?

During the present year four section meetings have been held. Your president was able to attend three of them. These meetings were all of high order, with discussion so free and full that it was difficult to complete the programs; indeed, at one meeting several papers were not read for lack of time. A total of sixty-three papers appeared upon the four programs and many of them gave evidence of marked ability and originality. From every possible standpoint the results have shown the wisdom of maintaining the section meetings. In fact, with our present membership it would be impossible with a single annual meeting to arrange a program which would permit the reading of so many papers and the opportunities of many of our members to present communications would therefore be proportionately handicapped. The section programs are necessarily largely miscellaneous in character, and they should remain so in order that individual members may bring into prominence the results of their special work along any line.

Under our By-Laws the transactions of the sections may be edited and abstracted by the publication committee.

The section meetings benefit the Society in another way not usually appreciated by the membership at large, in that the council is thus left free to construct the program for the annual meetings. This allows free and comprehensive presentation of topics of widespread interest and importance to the membership, and all may be done in proper sequence. The present program is largely of this type, the main topics having been decided upon by the Council after mature deliberation. It is my belief that this plan should not only be followed but perfected; and in the future it may even be found wise for the Society to vote upon the topics which are to be presented at its annual meetings, and even to suggest the names of those who should be invited to prepare the scientific papers. With this general plan for the construction of programs I am in full accord.

It is fitting at this point to commend the work accomplished by our four vice-presidents this year. A vice-president in this Society is not elected for purposes of ornamentation, or simply to assume the duties of the president in his absence, but he must arrange for and conduct the scientific meetings of the section which he represents. The results of the labors of your vice-presidents for the present year have given full evidence of your wisdom in their selection.

At the last annual meeting the Society appointed a committee to make a much-needed revision of our Constitution and By-Laws. During the year this committee has given much labor to the work of revision and their report, which is in your hands, recommending amendments, has received the full approval of the Council, and now awaits your consideration and vote. I heartily recommend the adoption of all the improvements and changes suggested by the committee.

It becomes my say duty to chronicle the death of two of our members, Doctor S. E. Solly, of Colorado Springs, and Doctor William P. Brandegee, of New York. A third death from our former members is that of Dr. J. B. Stone, of New York, who resigned his membership about two years ago on account of continued ill health.

Dr. S. E. Solly was the fourth president of this Society. He practiced his profession in England until ill health necessitated his seeking a different clime. and finally settled in Colorado Springs, Colo., in 1874. Here he ministered to the suffering multitudes who, like himself, had journeyed to this promised land. He was kindly in spirit, gentle but yet manly in manner, with an ever-ready wit, and equipped with a good mind and proper preparation for his life work. He succeeded not only in winning the highest esteem of his patients, but in gathering to himself the warmest friendship of his professional brethren.

William P. Brandegee! How the mention of that name thrills those of us who labored by his side in the hospitals and societies, where one's real nature crops out in the lesser details of almost constant association. His deep, melodious voice always struck a joyous note. When adversity came he was heroic, cheerful, and without cowardice or faltering. I never heard one unkind word spoken of him. He served as an assistant surgeon, also first in the Manhattan Eye, Ear and Throat Hospital, and at the New York Eye and Ear Infirmary from 1896 until the time of his death. The esteem in which he was held by his co-laborers in the New York Eye and Ear Infirmary was beautifully shown by having his chair in the clinic room vacant for over thirty days subsequent to his death, during which time a large vase upon his cabinet was daily replenished with beautiful flowers. Just as he was about to reap the full fruits of his constant toil the Great Reaper gathered him into His harvest.

The Council has appointed members who have been requested to prepare obituaries to be presented at this annual meeting.

A word as to our recent achievements. A little more than one year ago the Council set apart from its funds a sum of five hundred dollars designating it as an original research fund, from which a reward could be made to any member whose labors in the field of Laryngology, Rhinology or Otology should be productive of results showing originality. This was not done for the purpose of remunerating a member for his labor, but to enhance and dignify his achievement by a substantial acknowledgement, designed to confer upon him especial honor and incidentally to partially reimburse him for his necessary outlay in conducting experiments and research. One carefully prepared essay was submitted last year, but was not deemed quite up to the standard required by the Council in conferring this prize. During the present administration no essay has been submitted.

It is a pleasure also to state that the Society was enabled to set apart a further sum of one thousand dollars as a foundation for a permanent fund. This amount has been placed at interest and it is hoped that we may be enabled to add to it from time to time until it shall reach an amount adequate to produce an annual income sufficient to cover at least the expenses connected with all prize essays and scientific achievements. The treasurer informs me that the balance in the treasury at the present time is sufficient to warrant the addition of a further sum of $1,000 to this permanent fund. In order that we may legally hold and invest such funds, steps have been taken to have our Society incorporated.

My predecessor, in his masterful annual address, expressed a hope that ere long our Society would take steps to publish its own journal, predicting that "such a journal would immediately take its place as a recognized authority, and would be read by every laryngologist, rhinologist and otologist from the Atlantic to the Pacific," and stated that he was firmly convinced "that it would be self-supporting from the start, and as it would be the natural channel for the Society's transactions it would save us the separate cost for our annual publication, which is no insignificant item in our yearly budget." His recommendation was taken up by the Council and a committee appointed to report at the next annual meeting. The only real objection raised thus-far has been the fear that it might be a failure financially. I heartily concur with Dr. Logan's views, and sincerely hope that in the near future we shall publish a journal, the standard of which shall be of the highest order, devoted to the specialties which we have the honor to practice.

Should it be deemed impracticable for any one society to assume the responsibilities connected with the publication of a journal, the desired end might be accomplished by enlisting three or more of the American societies in the project.

This Society, during its entire existence, has been singularly fortunate in the selection of the members who have served upon the Council, and the past year is no exception. Your President acknowledges his great indebtedness to this wise body who have made all needed sacrifices of time and expense to fulfill their obligations. Several meetings have been held, all characterized by harmonious action, slight differences of opinion always giving way to the majority vote, and all matters of importance have been subjected to the most careful consideration and discussion. The President has received full and hearty support upon all measures relating to the best interests of the Society.

Our new Secretary has also exhibited marked ability and has conscientiously fulfilled the great demands required by this important office.

Permit me, at this juncture, to offer a few comments upon the question of absolute accuracy and truthfulness in reporting the results of our scientific labor. Without wishing to sermonize, or in any manner reflect upon the membership of this Society, I do wish to plead that our entire membership, whenever reporting the results of work, shall observe the strictest truthfulness of statement, fearlessly reporting the unfavorable as well as the successful, without selection, and never claiming complete cures in cases that have been but partially successful. To be more explicit, should an operation upon an accessory sinus be reported as a cure when a discharge of pus still remains? Should a report covering a large number of radical operations for the cure of chronic purulent otitis media be published claiming cures without the qualification that in a considerable proportion of such cases more or less aural discharge continues; or should such a series of cases be reported without a mention of the fact that accidents, complications and even fatalities have occurred, although in no wise due to carelessness or lack of skill on the part of the operator? It is my belief that the large majority of the membership of this Society are above criticism in this regard, and that they are possessed of the necessary moral courage to enable them to assume the highest possible standard in this matter. Honest errors in judgment must be expected and condoned. In the general run of published articles the experienced are usually able to read between the lines the evidences of wilful and dishonest neglect to fully report the unfavorable, but those less experienced are liable to be led into grave errors in following the teachings of men of this character. My plea is that the membership of this Society shall, with the finest *esprit de corps,* regardless of personal aggrandizement, in every instance exercise the greatest possible watch-care in their published articles, that such publications shall withhold no unfavorable results. A society with a reputation such as ours would become under such circumstancs would be the envy of the world.

The following letter was recently received by the Secretary of our Society:

(Copy.)

New York, December 29, 1906.

Dr. T. J. Harris, Secretary,
American Laryngological, Rhinological and Otological Society.

Dear Sir:—Will you do me the favor to inform me whether your Society has ever adopted an official nomenclature for diseases, and if so would it be possible for you to send me a copy thereof?

While the Census Bureau, United States Public Health and Marine Hospital Services and some State Boards of Health have adopted the Bertillion nomenclature, there is still much variety in nomenclatures both of diseases and operations, and it would be a matter of interest to hospitals to have a nomenclature come from so an authoritative a body as yours.

Thanking you for any information you may be able to give me in the matter, I am, Very truly yours,

(Signed) S. T. ARMSTRONG.

General Medical Superintendent, Bellevue and Allied Hospitals of New York City.

This letter calls attention to a matter of much importance. During the past two years I have had occasion to scan many of our text-books, journals and reprints which are published in the English language, and more recently I have compared the nomenclature employed in several of our hospital reports wherein diseases and operations are recorded. The variations in nomenclature are many, resulting in considerable confusion. It would add much to the harmony of our publications if an official nomenclature were adopted, and I recommend that a committee of this Society be appointed to undertake this work, with the power to request representatives of similar societies to co-operate. By this means it will become possible to devise a nomenclature covering the diseases and operations of the ear, nose and throat which can be adopted and employed by English-speaking otologists, rhinologists and laryngologists. I further recommend that a reasonable sum be drawn from our treasury to cover the necessary expenses of said committee.

It was my original purpose to incorporate in this address a brief resumé of the year's progress in Laryngology, Rhinology and Otology, but the time limit has already expired, and I must give way to the fruitful scientific program prepared for you.

It is a pleasure to welcome one of our distinguished foreign members in the person of Prof. G. Killian, who has journeyed to America in response to our invitation to present in person the results of his fruitful labors in the specialties covered by this Society. Many of us have been his pupils, and all have perused his writings. We give him our heartiest welcome and hope that his visit to America will convince him of the sincerity and earnestness of his confreres in the younger country, and of their desire to place these specialties upon the highest possible plane of scientific progress.

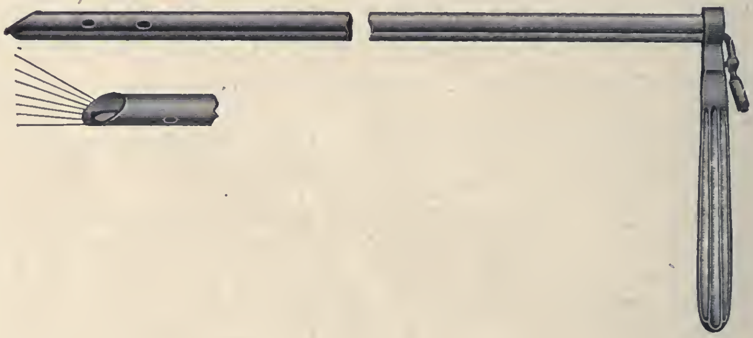
In conclusion, allow me to once more express my keen appreciation of the honor conferred in choosing me to preside over your deliberations. Hoping for your forbearance, and that my shortcomings may not mar the tranquility which should attend the official proceedings of this body, I now invite your attention to the scientific program which has been prepared for your consideration, and declare the thirteenth annual meeting of the American Laryngological, Rhinological and Otological Society open for business.

40 West Forty-seventh street.

A NEW BRONCHOSCOPE.

BY CHEVALIER JACKSON, M.D., PITTSBURGH, PA.

For some time past I have been using a modified form of my bronchoscope, which with the slide speculum renders bronchoscopy *per os* easy. No more than a few seconds are necessary in the average case, and any man, woman or child can be bronchoscopized through the mouth, provided there is no ankylosis of the vertebral articulations. I have passed it upon an infant four months of age, in whom as clear a view of the bronchi was obtainable as through the largest sized instrument practical with an adult. Two sizes are sufficient, 5 mm. by 30 cm. for children, and 7 mm. by 40 cm. for adults. A third size 9 mm. by 40 cm. is occasionally very useful, but is not essential. The diameters given are of the lumen of the tubes.



Park Bldg.

RETENTION IN THE MAXILLARY ANTRUM OF AN IRON BOLT THREE-EIGHTHS OF AN INCH IN THICKNESS AND ONE AND FIVE-EIGHTHS INCHES IN LENGTH FOR A PERIOD OF FOUR YEARS WITHOUT IMPORTANT UNPLEASANT SYMPTOMS.*

BY JNO. O. MC REYNOLDS, M. S., M. D., LL. D., DALLAS, TEXAS.

The patient, Mr. W. M. C., an electrician, 36 years old, came with the following history:

In February, 1903, while romping with a boy, he was thrown forcibly against the lock of a screen door inflicting a wound along the infraorbital ridge, but without producing any disturbance whatever of the eye. The wound through the soft tissues was closed with four stitches by the family physician who did not apprehend that any injury had been sustained by the bony structures beneath.

There was some bleeding from the nose at the time of the accident, but no significance was attached to it. The external wound healed promptly by first intention and there never developed at any subsequent time any evidence of a purulent accumulation within the antrum. For a few weeks, two years after the injury the patient suffered somewhat with what he called facial neuralgia on the injured side, but it passed off completely without creating any suspicion of a foreign body.

After the accident it was discovered that the screen door lock had disappeared and a search was instituted for it, but without avail. About two years ago, the patient observed that the two posterior molar teeth of the upper jaw on the injured side were becoming loose, and this condition gradually became more marked until in October, 1907, more than four years after the injury, the patient with his fingers extracted the two loosened teeth and then discovered a hard foreign body presenting at the opening thus produced. After a considerable amount of speculation as to the nature of this unsuspected intruder the bolt was easily removed by the astonished patient, who was then able to explain for the first time the mysterious disappearance of the screen door lock after the violent collision several years ago.

The case is one of interest, as it illustrates the high degree of toleration of foreign bodies which the maxillary antrum may endure.

Wilson Building.

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*Read before the Southern Section of the American Laryngolical, Rhinological and Otological Society, Baltimore, Dec. 27, 1907.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, January 22, 1908.

WOLFF FREUDENTHAL, M. D. Chairman.

PRESENTATION OF PATIENTS.

A Case of Neglected Syphilis with Marked Destruction of the Nose, Nasal Cavities and Tongue. By J. H. ABRAHAM, M. D.

Mrs. U., 44 years of age, married 26 years. Husband died eleven years ago of typhoid. Husband was well until his last illness. Has had four children. One was still-born, two died in infancy of summer complaint, one is 24 years old and in good health. Patient has always been well until her present trouble, which began four years ago, when she noticed a discharge from her nose and a marked nasal obstruction. Then she noticed that her nose was flattening, and finally it ulcerated and left an opening. Her upper teeth began falling out at the same time. Two months ago she began to notice a peculiarity in her speech. Regurgitation of food through her nose began about a month ago. A week ago she noticed a soreness of the tongue. She now has a complete loss of the bridge of the nose. Both nostrils have coalesced and are continuous above, with an opening which reaches almost to the level of the eyebrows. There is a large perforation in the hard and soft palate, about half an inch wide and two inches long. The septum is entirely gone. There is a broken-down gumma on the edge of the tongue.

The patient has had no treatment for her trouble until she applied for it two weeks ago. She is now getting intramuscular injections of a ten per cent emulsion of salicylate of mercury twice a week beginning with five minims and increasing one minim each dose up to ten minims. She is also taking K. I. by mouth, beginning with five minims t. i. d. and increasing one minim each dose. When last treated the gumma on the tongue had entirely disappeared.

Tubercular Ulceration of the Soft Palate. By J. MCCOY, M. D.

The patient, a young man 37 years of age, applied a week ago for treatment at the clinic. He gives a history of having had more or less lung trouble for five years. Two years ago he had night sweats, and since has had more or less of these, together with cough and expectoration. He was sent to the clinic by Dr. Bull, of Jersey City, for painful ulceration of the throat. Examination revealed superficial painful ulcerations involving the entire soft palate, uvula, and pillars of the fauces. It is rather unusual to see a case of tuberculosis with extensive ulceration of the soft palate and so little manifestation in the larynx. The larynx showed infiltration of right artyenoid and epiglottis.

A section was removed from each side of the throat and demonstrated the presence of giant cells and tubercle bacilli in the tissue, so that there can be no doubt of the correctness of the diagnosis.

DISCUSSION.

Dr. Freudenthal said that on first inspection the case seemed more like a syphilitic than a tuberculosis lesion, but as Dr. McCoy had investigated it carefully there could be no doubt of its tubercular character. He himself, however, had never seen such a lesion in a tuberculous patient.

Dr. McCoy replied that it impressed him as a typical tubercular lesion. It was pale instead of red, as in syphilitic lesions, it was superficial, and there was marked pain. These points seem to mark it as distinctly tubercular in character.

Dr. Freudenthal remarked that it might be owing to the quality of the light, but that the lesion had not seemed pale to him, and there is often pain in syphilitic lesions, though not so commonly as in tubercular ones.

Abscess of Both Nostrils, with Saddleback Deformity Corrected by Paraffin Injection. By Harmon Smith, M. D.

The patient, a woman aged 37, came to the clinic August 7, 1907, referred by Dr. George Brewer, complaining of inability to breathe through the nose owing to stenosis of the vestibule of each nostril. She also felt that possibly something might be done for the external deformity.

Nose was broken when a child of three years, after which an abscess of the septum formed, followed by destruction of the septum. Fourteen years ago, Dr. W. T. Bull inserted a silver plate for the restoration of the bridge, which remained in place for three years giving most satisfactory results. However, it worked itself out, and Dr. Weir inserted a celluloid plate which came out in six weeks.

Examination on admission to the hospital showed nearly complete atresia of both sides, also entire destruction of external cartilaginous septum, and some external scars where the two plates had extruded.

The two nares were opened by free incisions and some of the scar tissue removed. Two hollow splints were then placed in position and kept there continuously except when the nostrils were cleansed. She returned to her home in Utica after a month or so and took care of the splints herself, returning to the clinic January 2, 1908, when paraffin was injected to correct the external deformity. She had only one injection, with the result as shown. Another injection will be made before she returns home.

A Case of Trichinosis Involving the Upper Respiratory Air Passages. By J. A. MacKenty, M. D.

DISCUSSION.

Dr. David Bovard, Jr., said that his interest in the subject of trichinosis dates back about 15 years when, as ambulance surgeon he brought into the Presbyterian Hospital a family of three, all of whom had the disease. At that time such cases were not common, or at least the recognition of them was not frequent. After this his interest slackened until about two years ago when, in five months, five cases were admitted to the wards of the Presbyterian Hospital, and it seemed evident that such cases were becoming very common and that there might be causes leading to an unusual number of cases. Since then there had been no such succession of cases at any time, but in the course of a year there are usually two or three cases in the wards.

The clinical picture as seen in the hospital is nearly always suggestive of typhoid fever. The patients have fever, are prostrated, anaemic, dull, lethargic, and almost always impress the house staff as having typhoid. There are usually some suggestive features, such as edema of the face and lids—very marked and looking like the edema of Bright's disease—which, taken with the general condition of the patient put one on the track of the infection. There is regularly a leucocytosis, which typhoid patients have not. In some instances, however, this is so slight that the patients still pass as typhoid cases, and it is only by making a differential count that we differentiate the disease from typhoid., there is an eosinophilia, as first pointed out by Dr. T. R. Brown of John Hopkins, which runs from ten to as high as eighty per cent. Putting together the fever, the edema of the face, the leucocytosis, and the eosinophilia, we have a clinical picture which indicates quite positively that we are dealing with trichinosis. There have been altogether about ten cases in the Presbyterian Hospital, in every one of which the diagnosis has been confirmed by examination of the muscle tissue. A very small bit of the muscle is required to satisfy the conditions and the trichinæ are regularly found. They are imbedded in the muscle and present a picture of interstitial myositis which is highly characteristic.

The difference between the occurrence of the disease in this country and on the European continent is very interesting. In Prussia trichinæ are found in the hogs in the proportion of three in 10,000; in the United States the ratio is very close to three per cent. That is, we have nearly 100 times as much trichinosis in our hogs as is found in the Prussian. As to trichinosis in man, we have say twenty-five cases a year, while the Kingdom of Prussia reports over 200 cases a year, so that in man we see one case in this country to approximately ten in Prussia. Making allowance for the difference in population, the disproportion is much greater. The difference in figures is party explained by the difference in food in the two countries. Few of our people eat pork raw, whereas it is quite common for the Germans to do so, in the form of sausages, etc. In this way they ingest living larvæ which then develop readily in the intestines. That is the only explanation we have for the discrepancy in the occurrence of the disease here and in Prussia, but still it seems remarkable, considering the large number of German people we have in the city of New York, that we do not more frequently recognize it. He was inclined to agree with Mr. MacKenty that one reason accounting for the disproportion is that we are not sufficiently alert in suspecting the disease, or it would be recognized more frequently

Dr. Frank H. Parker had reported his observations on ocular conditions in trichinosis and in some cases the eye symptoms were the first manifestations of the disease. Dr. MacKenty reports cases where the laryngeal or throat symptoms were the first indications of the disease. Doubtless other specialists might find the first manifestations of the disease in their territories. There is little doubt but that if we were more alert in regard to trichinosis we would recognize more of these cases than we have done in the past.

Hematoma and Abscess of the Septum. By J. E. Newcomb, M.D.

Dr. Newcomb read a paper with this title, including also consideration of those cases styled perichondritis serosa and cysts of the septum. The term perichondritis is objectionable, as all the layers of the septum are involved. The septum was described in its developmental relations and special emphasis was laid on the fact that it was in its adult form a fusion of two layers. The most frequent cause of any of the lesions considered was trauma which might separate the two plates and so produce a swelling in each nostril or might fracture the cartilage so that the blood would run through from one side to the other.

Haematoma without trauma might follow severe influenza attacks. Abscess had been recorded after influenza, typhus and typhoid fevers, variola, erysipelas, sinus disease, larvæ in the nose, syphilis, tuberculosis, dental cysts and caries, glanders, anthrax and measles. In all cases there is more or less destruction of the quadrangular cartilage, though if the muco-perichondrium is left, the loss is made good to a varying extent.

It is estimated that the lesions considered occur once in about 1500 to 2000 cases in rhinological practice. It is difficult to say why they are not more common in view of the frequent trauma to which the nose is subject and the thinness of the mucosa at the anterior inferior end of the septum. Infecting micro-organisms very easily gain access here to the deeper parts. It has been suggested that the bactericidal action of the nasal mucous overcomes germ activity to a greater or less degree.

The author passed in brief review the symptoms of the condition and then took up the matter of treatment. Hematomata may subside under the usual treatment for such a lesion. Free incision is called for in all cases of suppuration and the freer and earlier the incision the less liability of deformity. This deformity is due not so much to loss of the quadrangularis as to destruction of the small cartilaginous plates on the dorsum of the nose connecting the shield cartilage with the nasal bones

Dr. Newcomb's personal experience comprises three cases of hematoma and fourteen cases of abscess. Of the entire number, eleven were due to trauma, the others to unknown causes. One of the haematomas came on without known cause, but a history of influenza was wanting. One subsided while the other two went on to suppuration. The ages of his patients varied from two to fourteen years. The ages of the patients with haematomas were respectively two, eight and eighteen years, the youngest being a case without known cause. In the abscess cases the time elapsing between trauma and appearance of symptoms varied from five to twenty-one days. None of the cases presented any special features. As long as they remained under observation no deformity was noted.

DISCUSSION.

Dr. Emil Mayer said that when Dr. Newcomb presents a subject he usually does it so concisely and thoroughly as to leave little to add. He had seen that afternoon in a clinic a child whose sister gave a history that she had been under treatment for some time and her nose scraped for what had been suspected to be a hematoma, but which proved to be a foreign body, which was removed.

The number of cases of abscess of the septum in comparison with the total number of nose cases is remarkably small, and yet he believed that the average in the dispensary is usually six cases in a year. Practically all the cases that he has seen of late years have been double. One case that he had seen in the New York Eye and Ear Infirmary occupied only one side. He had found that the best way to treat such cases after the incision was by the application of pure carbolic acid. A case that he had seen lately, which was practically the result of an abscess of the septum was that of a handsome young lady who was brought to him with a history of perforation of the septum and who had been told that she was threatened with a sinking of the nose and consequent deformity. There was a very large perforation, and at first he suspected a specific lesion, but a careful examination was made, and after consultation with her physician this was positively excluded. The history was that as a young girl she had a fall, followed by abscess of the septum, and this was doubtless the cause of the destruction which followed in the cartilage. Here was a case of perforation of the cartilaginous septum, but not of the bony septum, where the condition might easily have been mistaken for a specific lesion. The deformity that follows in most of these cases can be prevented by early incision and careful subsequent treatment. If they are promptly diagnosed and opened promptly, subsequent deformity would be avoided.

Dr. Delavan said that in his experience the number of so-called idiopathic cases of abscess of the septum had been small compared with those produced by traumatism or by specific disease. In most of the cases observed the abscess is bilateral. A point in regard to treatment which had not been suggested was that in most cases more or less perforation of the cartillaginous and bony septum has already occurred by the time the abscess is opened. In a bilateral case one is obliged to make two incisions, one on each side of the septum, through the mucosa. In making these two incisions it is often found that the septum is perforated. In order to secure free drainage and permit the retention of the drainage medium, he has followed the very easy and effective method of passing the drainage material through the septum from one side to the other, at the same time treating each abscess cavity as the case seemed to demand. By using horse hair, or several strands of silk or of lampwick, or some such material, the two openings could be kept successfully open, while there is no danger of the displacement of the drainage medium. The cases vary greatly in the extent and degree of destruction of septal tissue, as well as in the size of the abscess. While this method of drainage would not answer for all cases, as the main feature for securing drainage he has found it valuable.

Dr. Carter said that his experience in regard to hematoma and abscess of the septum had been limited, but that he is inclined to think that it is of more frequent occurrence than one is led to believe from the accounts in the recent books on rhinology. During the past year he has seen four cases at the Manhattan Eye, Ear and Throat Hospital, and two in private practice. Dr. Newcomb had made no reference to post-operative hematoma, this has assumed importance because of its occurrence, according to some writers, after the sub-mucous operation. In view of the popularity that this procedure has gained, a discussion of the subject of hematoma of the septum would be incomplete without reference to this accident. Two years ago, in a paper read before the Section, Dr. Carter outlined a technique that greatly minimizes the possibility of hematoma in connection with this operation—he does not attack the incisor crest unless it is absolutely necessary; he thus avoids wounding the arteries contained in the Anterior Palatine canal. The danger is not from the primary hemorrhage, but from the secondary hemorrhage, the blood accumulating between the layers of the mucous membrane, forming a hematoma. If this remains, or if it should become infected, there is very apt to be a flattening of the nose later on. In his own experience, Dr. Carter has never had a case of hematoma of abscess of the septum following the sub-mucous operation. He wished to emphasize the statement that he made two years ago; that it is best to avoid removing the incisor crest, but if it must be removed, the nose should be tightly packed beyond the wound, so that in case of secondary hemorrhage, the blood can easily escape from the operative wound and not accumulate between the layers of mucous membrane.

Dr. Carter's results have been excellent and he has made no change in his technique as described in the Laryngoscope of June, 1906.

Dr. Thurber said that at the Vanderbilt clinic they see from six to eight cases of abscess of the septum each year, perhaps one of them being in a woman. The cases are usually bilateral. He used a folded, narrow, rubber tissue drain until there was no more discharge. Nearly always there is more or less permanent thickening of the septum. Most patients fail to return after their nasal obstruction has been relieved, and for that reason the treatment was rather unsatisfactory.

Dr. McCoy said that a point in the etiology of such cases had been brought to his mind by a case seen not long ago. The patient had extensive swelling of the mucous membrane in the floor of the nose on both sides, without being able to trace the cause. It was tender and painful, and there was a pale, boggy edema. She was seen later and her upper front teeth were found loosened. She had Riggs' disease, which had found its way into the floor of the nose. He did not remember how many cases of abscess of the septum he had seen, but the last half dozen cases seen were recent ones, of not more than a weeks' duration, and he had obtained quick healing in every case. He made a good wide opening on one side, cleansed the cavity and applied pure carbolic acid within the cavity. He then tamponed both nostrils with bismuth subnitrate gauze, so as to force the laminæ of the septum together. This was removed at the end of four of five days, and in every case primary union resulted, with a straight septum. This treatment would also apply to hematoma. He would not care to employ this treatment where the cartilage was extensively necrosed, but in these cases there was pus or blood between the layers of the septum. The treatment resulted in quick and satisfactory cures..

Dr. Chappell said that he had had six cases, one of hematoma, five of abscess, all bilateral. Like Dr. Delavan he had some difficulty in securing proper drainage, and following a somewhat similar plan had used an aneurysm needle to pass the drain between the mucous membrane and the cartilage and then down the other side, washing the wound every day and removing the drain on the third day. In a week the cases were usually well without any perforation.

Dr. McCullagh reported a case of septal abscess in a tuberculous child. It was a traumatic case resulting in bilateral abscess. It was opened freely on both sides. The mother brought the child for treatment of the external deformity which was already beginning to be noticed, rather than for any trouble in the nose. Two or three weeks previously the child had fallen against the edge of a chair, and when brought in for treatment the deformity was already beginning to be noticeable.

DR. FREUDENTHAL said that he had only seen two cases in his private practice, but in his dispensary work in one of his clinics in the dirtiest part of the city, there is hardly a month that he does not see one or two cases of abscess of the septum and they are almost invariably due to traumatism. His treatment is very simple and he almost invariably secures good results. As soon as a case appears he makes a thorough incision on both sides, and tells the patients to make hot applications and the result is usually quite satisfactory. The cases which come back show mostly good results, but some have to be incised again.

DR. ABRAHAM inquired whether he was correct in understanding Dr. Newcomb to say that he never packed the abscess cavity, to which Dr. Newcomb replied that he had tried doing so, but had not been able to succeed in having the packing retained until the patient returned.

Dr. Abraham said that he had on an average five or six clinical cases a year, and in all, about five private patients. Recently while on a visit to Alabama he had seen another case. Dr. T— was hunting on horseback, and his horse stumbled, threw his head back, and struck the doctor on the nose. An abscess resulted, and when Dr. Abraham saw him he had a temperature of 103°, and a deformity was apparent just below the cartilage. The incision was made larger and the cavity curetted, and a pyogenic mass was removed, and particles of the cartilage came away like little rice seeds. This was three days after the abscess was opened. The wound was treated with pure tincture of iodine, making sure that it penetrated every nook of the cavity. Small strips of gauze were carried into the abscess, and it was packed with small strips to hold it in place. He uses this method constantly, and never has any trouble in keeping the packing in place, but he relies very much on the iodine.

In 250 cases of submucous radical and flap operation he has not seen over two cases of hematoma, and he attributes this satisfactory result to his method of packing the nose with iodoform gauze wrapped with gutta percha tissue.

DR. NEWCOMB, in closing the discussion, said that he had learned a great deal from the discussion, and was very glad that he had brought the subject up. He may have failed to make his statement clear about the horsehair. The method was simply to make a little loop and slide it up through the incision and pack against the mucosa. This holds the loop in place.

In regard to the bilateral character of these lesions—he had had only one patient with trouble on one side of the nose. In looking up the subject originally when he first saw a case of abscess of the septum, he had received the impression that the destruction of the cartilage was a very rapid process and that one had to be very prompt in the treatment or deformity would immediately follow. He had not found this to be the case. A case seen a year or a year and a half later might show some deformity, but the speaker had modified his ideas on this point very decidedly.

Dr. Carter's remarks on hematoma after submucous resection were extremely timely and appropriate. As Dr. Freudenthal said, these cases are extremely difficult to follow up, for the patients stop coming as soon as they can breathe through the nose.

Dr. McCoy's case of abscess resulting from Riggs' disease was very interesting. He himself had seen no such case, nor had he found reference thereto.

Dr. McAuliffe's case was unique in the position of the abscess. Most of them are low down anteriorly.

In regard to Dr. Freudenthal's simple incision, it had been his experience that where that alone was done the opening closed up and there was a reaccumulation of pus.

He has used the galvano-cautery in these cases and presumed that the iodine acts on the same principle.

Exhibitian of Forein Body Removed from the Bronchus. By SIDNEY YANHAUER, M. D.

Dr. Yankauer stated that the child from whom the foreign body had been removed gave the following history: The boy, five years old, had been eating pumpkin seeds, and had inhaled part of one. He was immediately seized with a fit of coughing, which soon subsided; following this accident a spasmodic cough, croupy in character, set in, accompanied by fever. The child was taken to the hospital, where an attempt was made by the attending laryngologist to introduce the Jackson bronchoscope, for the purpose of removing the foreign body. For some reason this attempt was unsuccessful, and the fever, and physical signs of consolidation in the right upper lobe, which had existed before the operation, continued. About a week later, on the eighteenth day after the inhalation of the foreign body, Dr. Yankauer was asked to see the case.

Fortunately the difficulties which had been met with in the first attempt were not experienced by the speaker. Under chloroform anesthesia, a Killian bronchoscope seven millimeters in diameter and twenty-eight centimeters long, was easily introduced through the larynx, and advanced as far as the bifurcation without seeing the foreign body; the instrument was then advanced into the right bronchus, which it entered easily. At a distance of twenty-two centimeters from the upper teeth the foreign body was seen; it lay in a favorable position for extraction, the greater part lying directly across the lumen of the bronchus, the remainder, about one-third, being folded upon itself and lying in contact with the posterior wall of the bronchus. It was seized with the Killian forceps and withdrawn, and was found to correspond in structure and form to about one-fourth of the shell of a pumpkin seed. It was irregularly oblong in shape, twelve millimeters long and eight millimeters wide. It lay a little below the middle of the bronchus, in a position corresponding to the point of origin of the first bronchus of the second order, the one which supplies the righ upper lobe. The time occupied in this portion of the procedure was about four minutes.

Upon examining the bronchus after the removal of the shell, a white body, five millimeters in diameter was seen deeper in the bronchus, which looked like a part of the pulp of the seed. An attempt to remove it with the forceps was unsuccessful, as the bronchus became conically smaller below the end of the bronchoscope, and the forceps was too wide to reach the bottom; the Lister hook was also tried with the same result. A wire with smooth rounded end was then introduced, in order to tease the mass up into the bronchoscope, but as soon as it was touched with the wire it was broken into several smaller pieces. Some of these were coughed
The bronchoscope was now removed, the entire time occupied from the beginning of the introduction to the end of the procedure
up, the rest were removed with a cotton swab.

The bronchus was again inspected. Its mucous membrane was congested, the openings of the secondary bronchi were narrowed (about one millimeter), by the swelling of their lining.
being less than nine minutes.

Dr. Yankauer stated that he had not seen the patient since, but the subsequent history is as follows: Immediately after the removal of the foreign body the signs of consolidation over the upper lobe disappeared and the temperature became normal. After forty-eight hours the temperature again rose to 103°, and signs of pneumonia appeared over the right middle lobe. These symptoms continued unabated for two weeks, when a needle was introduced in the middle of the area of consolidation and pus was found. It was decided to perform pneumotomy. An incision was made over the eighth rib and one and one-half inches of the rib removed. Upon opening the pleura no pus was found; the surface of the lung looked normal; the lung was only partly retracted. A blunt instrument was introduced into the lung, into the wound made by the aspirating needle, and at the depth of about one inch pus was encountered. The wound was enlarged, a drainage tube was inserted into the lung, and the pleural cavity isolated by packing iodoform gauze around the drainage tube. About six ounces of pus were evacuated.

Following the operation considerable pus was discharged through the tube, but only once was pus expectorated. At the present time, twenty days after the removal of the foreign body, the temperature is 102° to 103°, respirations 45 to 50, pulse 110 to 130. The general condition is fair and the prognosis doubtful.

The case is of special interest because the foreign body lay directly over the opening of the first division of the right bronchus, leading to the upper lobe, and caused occlusion of this bronchus with signs of consolidation (atalectasis). It is probable that during the operation of removal a portion of the pulp was inhaled into the bronchus leading into the middle lobe, and was the cause of the abscess in the lung tissue in this lobe.

DISCUSSION.

DR. EMIL MAYER said that this case teaches the importance of the early removal of foreign bodies, especially those which have a tendency to swell. He had emphasized this point in an article some time ago. The only fatal case that he had had was one in which a bean had been inhaled, in which the child died of pneumonia subsequent to removal. This case had taught him the danger of delay. It was of the greatest importance to know the nature of the foreign body, in cases where one is called upon to decide whether the immediate removal is imperative or whether one can wait.

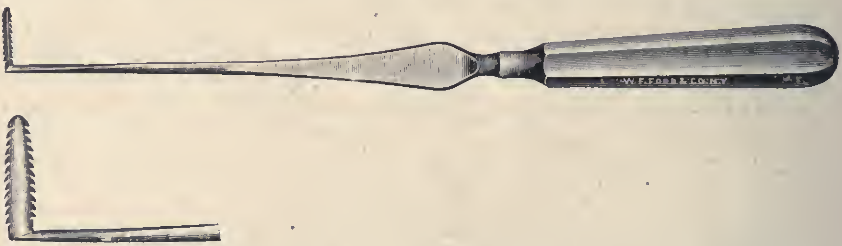
DR. YANKAUER replied that this had not been done. The pulmonary pleura was not adherent to the parietal pleura, and it was not sutured thereto. It was merely opened and the wound packed. The doctor was asked if the general pleural cavity had become infected, and he replied that it had not.

Of the various vegetable seeds and kernels, the most dangerous one encountered in the lungs is the bean; it has a thin shell, and its pulp swells up into a semi-solid mass. When it is seized in the forceps the shell breaks and the pulp is scattered throughout the bronchial tree with the next inspiration. The peanut is not nearly so dangerous, as its pulp retains its coherence for a long time. In a case reported here a short time ago, the peanut kernel was broken and the separate pieces removed, the patient making a rapid recovery. While the foreign body presented to-night, a pumpkin seed, is not a common article of diet, it is interesting and important to know how it behaves when inhaled; evidently its pulp becomes very soft, like the bean. It is, therefore, a dangerous substance to inhale.

PRESENTATION OF INSTRUMENTS.

Exhibition of New Tonsil and Pillar Separater. By John McCoy, M. D.

This instrument was devised to separate principally the adherent anterior pillars of the fauces from the tonsil, and to accomplish this with as little hemorrhage as possible, so as to prevent obscuring the field of operation in tonsilotomy.



It consists of a blade at a right angle to the handle. On each side of the blade are a number of saw teeth which point at an angle toward the handle. The saw teeth are somewhat sharp on their presenting faces. The teeth are so arranged that one side of the blade can be applied to the left pillar and tonsil, and the other side to the right pillar and tonsil. The handle has a wide flare at its mid portion so as to give purchase to the index finger for pushing.

The instrument is used in the following manner: The blade is pushed well into the supratonsillar fossa, it is then rotated downward to the tongue, and is pushed through the adherence, *in a direction toward the opposite tonsil.*

I have been using the instrument for some time, and it has given me great satisfaction, both in thoroughly separating the pillar and tonsils, and also in the diminished amount of bleeding that ensues. This is not inconsiderable where a sharp knife is used.

Demonstration of New Method of Introcing a Posterior Tamponnade. J. Wolff, M. D.

DISCUSSION.

Dr. McCullagh called attention to a somewhat similar method of packing the posterior nares or nasopharynx, devised by Dr. Roof,—which consists of a strip of gauze, to one end of which a strong piece of silk thread is fastened in such a way as to leave the two ends of equal length. One end of the silk is then threaded on a needle and long stitches are taken in the gauze until the whole strip is threaded. By means of this device the nasopharynx can be packed very easily through the nose, and the packing does not have to be dragged through the mouth.

The knotted end is introduced into the nasopharynx through the nose, the free end of the silk thread hanging loosely from the nose, while the gauze is passed along the other thread, which is held fairly taut. This thread is pulled on at times to pack from behind. When sufficient gauze has been inserted, the two ends of the silk thread are tied over the gauze, thus eliminating any danger of the packing dropping back. For removal the thread is cut, and the gauze comes away in a single strip. Dr. McCullagh said he had used this method two or three times, and had found it very rapid and effective.

Presentation of a Number of Historical Instruments, the Gift of Dr. N. S. Jarvis. By D. B. Delavan, M. D.

Dr. Delavan presented a number of instruments, the gift of Dr. N. S. Jarvis, of the U. S. Army. These were pioneer instruments devised by his brother, the late Wm. Chapman Jarvis, of New York City, and mark the beginning of certain familiar processes which are now commonly employed. Dr. Jarvis was the first to use chromic acid in the treatment of the upper air passages, and devised the well-known method of fusing a crystal on the tip of a probe. Among other early instruments here shown were a variety of nasal cutting forceps, the original Jarvis snare, a self-retaining nasal speculum, a rhinoscopic mirror, nasal scissors, a septummetre, nasal splints, and instruments for straightening deflection of the septum, etc. All of these instruments when devised were great improvements over the methods generally employed at the time.

A New Adenoid Curette.

Dr. Herzig presented a new adenoid curette with three edges, thus enabling one to remove the lateral masses with a single sweep of the curette, and then to remove the main masses.

Dr. Freudenthal said that he had tried this curette and found it to work very well indeed.

A Modified Spectacle Frame for Supporting a Face Mask.

Dr. J. E. Newcomb presented a modified spectacle frame, devised by Dr. Johnson of Manchester, England, which had been described in a recent number of the *Lancet*. In this frame the upper half of the rim was removed, while the lower halves dipped down on the cheeks and were united across the bridge of the nose. Over these lower halves a pad of gauze could be folded so that it would be supported over the face below the eye level, and at the same time afford free access of air to the nose. It was efficient for its purpose, and at the same time very cool and comfortable. It was quite out of the way of the head mirror in nasal work. It was so simple that one could easily be made with a piece of stout copper wire and a pair of pliers.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

Twenty-ninth Annual Congress. Washington, D.C., May 7 to 9, 1907.

A. W. DeRoaldes, M. D., President.

(Continued from the February number, page 160.)

CONTINUATION OF DISCUSSION OF DR. COAKLEY'S PAPER.

Dr. A. Coolidge, Jr.: My experience has been largely with Dr. Clark, and I have nothing in which I differ with him at all. Papilloma cases are divided into two classes: those in children and those in adults. Each class presents a different problem. I have failed to see a case in an adult not easily kept down by intra-laryngeal methods, and it seems to me that the direct method is the preferable one. In children the problem is different. Up to the time of the introduction of Prof. Killian's tubes the conclusion that I reached was that the best treatment is to do a tracheotomy and leave the tube in. Afterwards, if the tube is taken out, there is often a recurrence; and a second tracheotomy must be done, which is worse than if the tube had been left in for years. The question of leaving the growth alone after the tube has been put in must be settled according to circumstances; but it is never advisable to go into the larynx, unless considerable can be got out with but little trauma. This can be done better with Killian's tubes than with any other single instrument. Consequently, after the introduction of the tracheotomy-tube, we can keep the larynx clear better by the direct method than we could before its introduction. I do not know whether the use of the straight spatula in children is going to make it possible to do away with tracheotomy. Dr. Ingals thinks it better to do it, even if the direct method has been used. It seems to me that we may get rid of the necessity for doing a previous tracheotomy by acquiring better technique and a better knowledge of Professor Killian's method.

Dr. Samuel W. Langmaid: I happen to have brought with me something that illustrates what Dr. Coakley and the other gentlemen have said. I had intended to exhibit it as a pathological specimen, but if I may be allowed to illustrate what has been said by this I shall do so.

I agree with Dr. Coolidge that we must distinguish, in treating papilloma, between the cases of adults and of children; and with Dr. Castleberry, especially when he says that circumstances modify cases—the circumstances of the age of the patient, his temperament, our own convenience, etc.

My case illustrates several points; in the first place, the recrudescence of the growth. It is impossible that all that could have existed originally. I had the pleasure of showing it to Dr. D. Crosby Greene, of Boston.

The patient, a man between 20 and 30 years of age, came to me with a large papilloma on the tracheal side of the epiglottis, and with the larynx pretty well filled up. I examined him for quite a number of days, and found that the growth was increasing. I began to operate with the ordinary canula-forceps; but the tumor increased faster than I could get it out. At last it occurred to me that in condylomata nothing is so good as a mixture of alum and powder. I used this, and the growth seemed to halt. I have been three years in getting it out. It has been done at my convenience, and with very little expense to the patient; and the result is perfect. He has come, perhaps, every fortnight or every month. Then I used another remedy in the intervals. He was to spray his larynx thoroughly during these periods, four or five times a day, with a strong solution. I cannot help thinking that both these remedies were better than anything else I know of. At last, I think it was in December, but one growth remained, which was about in the middle of the right cord. That I took out, and this has been the end of the trouble.

In speaking of circumstances, it should be said that this man never had dyspnea, except on rapidly going up stairs—why, I do not know. When I got down to the cord, I found that it did not make the excursion that it should. The cough was very little, and there was no dyspnea. Had there been dyspnea, this protracted method would have been quite wrong. Larger growths than this have been shown to this society, but this is large enough to answer the purpose of illustration.

I wish to endorse Dr. Clark's paper, which pleased me very much. My first belief in the value of that method of treatment was founded upon but two cases, one being a quite interesting one in which, after I had done a tracheotomy, in the child, who was then

5 years old, every papilloma had dropped off by the end of the succeeding five years. I saw the patient during his trips through Boston, and found that there had been less and less of the growth. All had dropped off until nothing remained. I then did a plastic operation, and the case was over.

DR. D. BRYSON DELAVAN: I think that in studying this subject we are impressed with two facts; the inveterate tendency of the growths in children to recur, and the means employed to keep the larynx open; the long-continued wearing of the tracheotomy-tube, and its effects on the larynx and the upper part of the trachea. The treatment of no case should be undertaken without a full understanding of the first proposition. We know of no means, nothing has yet been suggested, by which papillomata can be properly treated and absolutely prevented. Attempts have been made, and with mild cases have often succeeded. I have described a method, and so have others, whereby the local application of certain medicaments to the larynx has cured papillomata; but in other cases it is impossible to obtain such a result by this means. We have, therefore, to resort to operation. Having the probability of recurrence in view, the mechanical method chosen should be selected with great care. Dr. John Rogers, of New York, has pointed out the conditions that arise from the long-continued wearing of the tracheal canula. He has shown that various deformities caused by this occur, and that these deformities are extremely difficult to treat. The various strictures that take place in certain localities that the tube touches are very difficult to overcome. It is certainly most gratifying that removal of these growths without tracheotomy can now be accomplished in some cases. This first case of the kind that I remember in this country was described by Dr. Cooper a number of years ago. In this case he removed a large growth completely. It is gratifying that we have given to us so admirable a means as that described by Professor Killian, which marks a great advance in the local methods of dealing with these conditions. In no circumstances should a case be considered as cured until a long time has elapsed, in which the patient has been kept under observation to prove the disappearance of the growth for all time.

DR. THOMAS HUBBARD: I hope that Dr. Coakley, in closing the discussion, will express his opinions as to the post-operative treatment of cases of papillomata of the larynx. I do not think he spoke of this at any great length. I had an opportunity to examine a case operated on many years ago, in which I had used a fenestrated tube made after the O'Dwyer tubes, but not by the direct method. With this instrument I could see the growth distinctly. I removed it with the forceps and the curette, and subsequently used trichloracetic acid. The growth, which had occupied the anterior third of the larynx, was examined in the Pathological Department of the Manhattan Hospital, and was reported to be probably malignant. In the many years that have since elapsed, the growth has not recurred; and the patient has a perfect voice. Examination a few days ago, however, showed a small papilloma about the left vocal cord. This is probably not a recurrence of the original growth.

Dr. J. H. Bryan: I want to ask about the strength of the cocaine used in these cases, and whether serious results have followed its use.

Dr. J. M. Ingersoll: I have had a little experience with the X-ray that seems to have been favorable. I have at present under my care a young girl in whose case, thinking the growth would recur, I tried the tracheotomy tube, which she wore about a year. Then I began to use the X-ray every day, and the growth commenced to disappear. This disappearance led me to think that such growths might be favorably operated upon by the direct method. On account of the bleeding and the consequent use of cocaine and adrenalin, I operated under general anesthesia. I could not remove the two growths completely, and a small part of each was left. This was eight weeks ago. Since this, the growths have disappeared under the use of the X-ray. This suggests that the X-ray may overcome the tendency to recur. There is a third growth in this case, upon which I shall soon operate.

Dr. C. G. Coakley, closing: I thank the gentlemen very cordially for their very kind expressions regarding my paper. It was written simply with the wish to introduce this method to the attention of the men here; for I believe that it is of some importance. It will not cure every case of recurrence, however. The first case, operated on in October, showed a subsequent slight increase. There had been a small part of the growth left, and this has grown; but not so much as one would expect. Some papillomata grow more rapidly after any form of treatment. My other cases are too recent to tell whether there will be a recurrence or not. In none of them did I feel that I had absolutely cleared out all the growth. I could not get all out; because, towards the end of the operation, small pieces are obscured by the slight amount of bleeding that occurs, and one cannot differentiate between these little pieces of papillomata and the mucous membrane. Claim this procedure to be a radical cure, I cannot; but it is safer than any other method of instrumentation, and one can do more at a time by the introduction of these tubes than by any other of the older methods by means of the indirect illumination with a mirror. One can do more, and with a great deal more safety to the patient. With the other method, it has occasionally happened that I have taken away some of the healthy mucous membrane or of the cord, and other men have had the same accidents. Some of the parts not meant to be removed were caught in the forceps and taken out. This danger is entirely done away with by this method. The parts are quiet, and the only trouble is that one cannot be sure that one has got all the growth out at the close of the operation.

I believe that the cases of recurrence in children are cases in which new papillomatous areas occur. This happened in Case No. 4. New areas would crop up in the larynx, in spite of everything I could do. Just during the last few days an area developed, which grow very rapidly; and I did not know how big it would have become before the voyage across the water was completed. I felt ashamed to think that Dr. Killian would find there a large papilloma. The growth was merely the size of a pea when the patient left, and nothing had been done for more than a month previously.

In these cases of papillomata in children, we are dealing with cases that will frequently recur; and I do not consider any of the patients as cured. I should not do so, unless they had remained free from the growths for several months.

I think that Prof. Killian has put the right emphasis on the discussion when he said, "if we see the cases early enough." I believe that it is going to be possible in most of the cases to avoid the deformity of an external operation. Well-to-do people would do anything to avoid having a thyroidotomy or a tracheotomy performed upon any of their daughters. I think that tracheotomy, by giving rest to the larynx, is an aid in causing the disappearance of the growths; but it is a question whether the parents of such children would desire to have a tracheotomy, with the disadvantages caused by it in after life. A tracheotomy-tube worn for years is going to leave some stricture. There is bound to be some thickening, though it may not be enough to give much trouble. It is, however, to be considered. If you see these cases early enough, before the entire larynx is filled so that the dyspnea is great, this method should be the method of choice; and in such cases I always advise this method of removal. On the other hand, if the growths are large, one should not give an anesthetic without having a tracheotomy-tube handy, and being ready to do an immediate tracheotomy; because the tissues are relaxed and the growth often seems to fall down and fill the glottis, so that it is dangerous procedure unless one is prepared to do a tracheotomy at any instant.

A ten per cent solution of cocaine will be sufficient, if one waits long enough for it to act. That is my idea in applying the cocaine before the administration of the anesthetic. The weaker solution will then give as much result as would a twenty per cent or a saturated solution. I have been asked whether I am not afraid to give cocaine in connection with chloroform. I have given it a number of times without bad results. In two of the cases, as I finished up my work, I took a cotton applicator, dipped it in pure carbolic acid, and touched the bases of these masses. I do not know that this did any particular good because in Case 4, that of the young lady who went abroad afterwards, the growths returned over some of these areas. I cannot say, therefore, that the carbolic acid did much good. I think it is perfectly harmless, but I should not use it unless the patient had had a tracheotomy. I should be afraid that it would render the performance of a tracheotomy necessary. The advantage of this type of work is that one can, in some cases, save the patients from the necessity of tracheotomy.

Ophthalmological Manifestations of Latent Disease of the Nose and Its Accessory Sinuses: Report of Illustrating Cases. By FRANCIS R. PACKARD, M. D., Philadelphia.

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DISCUSSION.

DR. J. H. BRYAN: I have been very much interested in this paper, and am delighted to find that the eye in relation to disease of the accessory cavities is commencing to receive consideration. It has been my practice always to have an examination of the eye made by a competent oculist. I have had some of the most remarkable complications shown in the eye itself. In a paper read before the American Medical Association, I detailed some very interesting cases: sphenoid cases resulting in paralysis of the external recti and scotomata, narrowing of the visual fields, and bulging pressure of the eye in various directions. They all showed that the eye, from the diagnostic standpoint, is a most important thing; and if men interested in the subject of the accessory sinuses will submit the patients to a thorough ophthalmological examination, they will often find the result of this examination a great aid, not only in those cases in which the disease is well marked, but even in those in which it is merely suspected.

Dr. George A. Leland: I do not think that Dr. Packard has any need to apologize for having read this paper; for we are beginning to find that troubles in the eye are largely dependent upon varying intranasal pressure; not always where the necessary sinuses are diseased, but also in cases in which there is a malposition of the septum or of the turbinal bodies.

There are three cardinal symptoms that point directly to the intranasal conditions for their origin. The first is astygmatism against the rule. When one finds this, one usually finds that the intranasal lesion is the cause. There is also a ciliary reflex. This has occurred in my practice quite a number of times, when the oculist has fitted many different kinds of glasses. In one case, he fitted seven different lenses to correct an astygmatism that varied with different kinds of intranasal pressure. I did a slight burning of the cushions of the septum, and later the patient required no glasses at all; and he has worn none since.

Then we have a narrowing of the color-field. It has been frequently my experience to have cases in which the ordinary fields diminished somewhat, but the color-field diminished greatly. One lady had been an invalid from the age of fourteen years to that of fifty, all on account of her eyes. The color field was so much diminished that when she looked at her Italian garden, it appeared to her as if she were looking at it through a hole in a board. After the intranasal pressure had been removed, the whole garden came into view. That case I would summarize a little. I will just read the summary that Dr. Haskell has got out, which will give the major points of the cases in which the eye is affected so much by the nose. It is a good thing for us to find out from a rhinologist the confirmation of our point of view that so much of the trouble in the eyes is due to the nose. When this is generally realized, we shall have less people having defective eyesight.

This is the lady who began to suffer at the age of ten or twelve years, and had to stay in a darkened room for two or three days of every week or fortnight, on account of the terrible headache that prevented her from reading, looking at pictures, or conversing with other persons. The pain, tension, and lowered vision, and the contracted field included all the symptoms of glaucoma except the copying of the disk. They were all temporarily relieved by the use of Filocarpin, etc. There has been no recurrence since the intranasal contacts have been done away with.

She was first operated on in March, 1898. This had to be repeated several times; until finally I gave up in despair of being able to do anything without removing both turbinates. Another thing peculiar about the case was the pain in the left side of the head that sometimes appeared after an operation on the right side. There was myopic astygmatism of the axis, the amount of which varied in the right through an arc of 90°, and in the left through 25°. These variations were most marked after operations on the nose, or when pressure in the nose was increased by swollen turbinates. The refractive error of the right eye disappeared entirely, so that the axis came just where it should have been; and that of the left diminished 25°. She was last seen more than five years after the last operation, and had remained quite well ever since. The extremely neurasthenic condition found in many of these cases is very much relieved after the operation. This patient became so much improved that she often forgot herself and read or wrote for a long time. Once she numbered all the checks in a check-book, and had no trouble resulting. I think we have this paper in good time. In fact, it is too timely; because I wanted to write on the subject.

DR. L. A. COFFIN: I want to congratulate Dr. Packard on being so early in the field. I am rather chagrined that I have been working for so many years in an institution in which we have both these specialties, and yet the relation between them has not been appreciated there. At a meeting of the Section of Laryngology at the County Medical last winter, Dr. Posey read a paper on the subject, and said that laryngologists are rather opposed to admitting the relationship; and I stated then that we had come to recognize the relation between the nasal and aural disease largely through our patients, who, without solicitation, had informed us that after a certain amount of work done on the nose the ears had improved, and they had been forced to appreciate the relation. I had never, however, had that made apparent in regard to the eye.

It was not a week after this meeting that a patient upon whom I had lately operated for sinus-disease voluntarily said to me: "Doctor, I am now able to lay aside my glasses." He is still getting along without them. We often find in sinus work that certain ocular conditions clear up after the removal of the pressure. Dr. Posey was so rapid in reporting his cases that I could not think of all I wanted to say. I wish to say now that I am a convert to the belief in the relationship.

DR. J. W. FARLEY: Speaking of Dr. Packard's being one of the first in the field, I should like to call attention to a paper written by Dr. Sluder, of St. Louis, which appeared in an ophthalmological journal. This paper was published five years ago, and it appealed to me. He is not a member of this society, and able to report his own cases; so I should like those here to refer to the paper, and find that the same thing has been observed when there was no sinus-disase.

DR. F. C. COBB: I read a short paper on the subject a year ago, and I wish to call attention to what I think is a mistake on the part of Dr. Leland in saying that the oculists in Boston have not taken much pains with it. I know of three or four papers beside the ones mentioned that have treated it in that way.

That in cases of sinus-disease, such as we have heard to-day from Dr. Packard, conjunctivitis arises through direct infection from the nose to the eye, there is plenty of evidence. With regard to astygmatic affections, there is little satisfactory evidence. The cases that have been reported are, as Dr. Leland says, possessed of a tremendous neurasthenic element; and I think that when cases in which pressure in the nose, without disease of that organ, is supposed to affect the eyes are investigated, we should be very careful to eliminate the neurasthenic element from the question before deciding on a scientific basis how much pressure-points affects the eye.

DR. H. P. MOSHER: So far as I know, ptosis is a rather unusual symptom of latent disease of the frontal sinus. I have had it occur once, first on one side and then on the other. It was first noticed on the left side, with acute trouble. If anyone knows of another such case, I should like to hear of it.

As to weakness of vision due to trouble in the sinuses or the ethmoidal region, I have come to the conclusion that in unexplained trouble with the eye, an examination with the X-ray will, in many cases, clear up the condition. When this is done, one will often find that it is an ethmoidal condition that has given no signs in the nose.

DR. A. COOLIDGE, JR.: I wish to say, for the information of some of our Fellows, who do not seem to know the literature of the subject, that the relation of the eye to sinus-disease has long been recognized. Dr. Fish, of Chicago, Kocher, and dozens of other writers have called attention to it. The eye-symptoms, as named in Dr. Packard's paper, have been known to be associated with sinus-disease for a long time. Dr. Coffin spoke of Dr. Packard as a pioneer. I do not wish to rob him of this honor, because he is one of the pioneers; but I merely wish to remark that the subject has long been written on.

DR. L. A. COFFIN: I know that as well as Dr. Coolidge does.

DR. GEO. A. LELAND: The paper that Dr. Farlow has referred to was instructive to me. I had the pleasure of going to Dr. Sluder's office and looking over the specimens he has. They show that with those long Killian forceps we can see the attachment of the second turbinates, and in some cases over the second turbinate this ethmoidal tumor pressing upon the turbinates. I wish to give credit to Dr. Sluder.

DR. F. R. PACKARD, closing: I wish to say I have not gone into the literature of the subject in the paper. I merely wonted to present to rhinologists the findings of an ophthalmologist in a definite series of cases. The cases were all latent, none having presented manifest nasal symptoms; and I thought it interesting to know just what an oculist had found in his examination in such cases.

(*Proceedings of the American Laryngological Association to be Continued.*)

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

LARYNGOSTOMY.

BY DR. J. BARATOUX, PARIS, FRANCE.

Among all the chronic affections of the larynx, there is one which, from the length of time required for treatment and its tendency to recur, and because of the general trouble it occasions, may be termed the bête noir of the laryngologist, I refer to cicatricial stenosis of the larynx and the contraction of that organ in a patient wearing a tube or canula following intubation or tracheotomy. Several successful attempts with a new surgical procedure encourage me to think that it may be possible to obtain satisfactory results where heretofore the cure has been approximate or the result a failure. There are still many cases in which the canula cannot be dispensed with as an aid to respiration.

The purpose of the operation to which I allude, laryngostomy, is to expose the larynx and very frequently the upper portion of the trachea (laryngo-tracheostomy) for a prolonged period. The first operation of this kind was performed the 26th of January, 1898, by Dr. Ruggi,[1] of Modene upon a child of five years who had undergone a tracheotomy for the removal of two laryngeal polypi. These recurred after two months, when they were removed by a low tracheotomy. Two years later, in spite of wearing a canula, the patient experienced difficulty in breathing and desired the removal of the canula. Dr. Ruggi then performed the operation for laryngo-fissure by separating the thyroid cartilage and opening the larynx, which permitted the removal of numerous little papilloma; he then curetted that part which he intended to dilate by a special method of tamponage. He then introduced into the laryngeal opening a little pocket of rubber tissue, filled with bits of sterilized gauze. This pocket served as a dilator and at the same time the rubber tissue did not adhere to the mucous membrane. This treatment was renewed each day during two months until the cartilage had finally yielded to the action of the tampons and it was possible to remove the tracheal canula and close the tracheal and laryngeal openings. Twenty days later the patient was able to leave the clinic and though aphonic, the voice gradually became clearer. Dr. Ruggi also performed this operation at Boulogne upon a patient wearing a tube who had been treated unsuccessfully by several methods of dilatation.

Another attempt, not as successful, however, was made by Dr. Jaboulay,[2] of Lyons, who, in 1899, twice opened the larynx in a syphilitic, who had previously in 1897 had a tracheotomy performed by Dr. Garel. In 1900 Dr. Jaboulay noticed a recurrence which necessitated total laryngectomy.

In June, 1901, before the Belgian Society of Otologists, Dr. Beco[3] of Liege, reported the case of a child of four and one-half years that for two and one-half years had suffered with hoarseness, following measles. Later a cough and difficulty in breathing developed. The adenoids were removed and an examination of the larynx revealed a papilloma. Following the attack of measles and whooping cough with persistent expectoration, the increased suffocation necessitated a low tracheotomy in 1899. Eight months later, the obstruction of the larynx became greater than after the tracheotomy. In July, 1900, a thyrotomy was performed. The larynx was filled with a papillomatous mass, pressed in between the vocal cords superiorly and the ventricle. These were removed by means of the cutting nippers, the bistoury, the scissors, the galvano-cautery, and later the thyroid cartilage was closed by sutures. After fifteen days, the tube was removed. A recurrence took place after four months and was followed in November, 1900, by a tracheotomy, which revealed two enormous polypoid masses and laryngo-fissure was performed. An incision of the cricoid cartilage and in the superior rings of the trachea was made. These parts were thoroughly cleaned, tamponed with iodoform gauze and a canula inserted. After five days, under an anaesthetic, the tampons were removed and the incision in the trachea was extended to the canula, but as other polypoid masses were found, the tracheal incision was extended to the notch of the sternum at the base of the laryngeal fissure, the canula was re-introduced, the thyroid and cricoid cartilages closed with silk sutures, and dressing made without suturing the skin. At the end of a week the cartilages had re-united and the canula was removed.

Dr. Beco concludes that if the operator is not certain that he has removed the entire neoplasm, or if the curettement undertaken exteriorly is followed by a recurrence, it is expedient in subsequent operations not to immediately close the laryngo-tracheal opening with suture, but to tampon it for a time and to suture it when there is no indication of a recurrence. The sutures need not be placed along the entire length of the tracheal incision.

Dr. Capele, of Boulogne, in 1904, operated upon a patient wearing a canula, who was not cured after various efforts at dilatation. Ruggi shortly afterward performed a similar operation upon an adult who for several years had worn a canula and which it was found advisable to retain.

The idea of a temporary opening in the larynx was advanced also several years later by Dr. Grossman,[4] of Vienna, who speaks as follows of his treatment of cancer of the larynx by means of X-rays:—A tracheotomy is followed by a laryngo-fissure. The neoplasm thus exposed is radically extirpated and the galvano-cautery applied to the involved area. The laryngo-fissure is maintained and daily applications of the X-ray made directly to the diseased tissues. The applications are facilitated by spreading the two wings of the thyroid cartilage as much as possible with forceps. This method permits not only a more rapid and more intense action of the X-rays, but allows one to readily follow the healing process and to detect more easily any signs of recurrence.

Killian[5] of Freiburg, in Breisgau, was the first to apply laryngostomy successfully in three severe cases of stricture of the larynx, one of which occurred in an adult following typhoid fever. This author has made no report on this subject, presenting only the canulae in T form of red rubber, which he used in the final treatment. Dr. Reimer of Dusseldorf, also tried these canulae.

One month earlier, Dr. Rabot of Lyons, in conjunction with Drs. Sargnon and Barlatier had shown the case of a child that had been operated on in April, 1906, in which Dr. Sargnon had followed in large measure the Killian method. Another case was shown by him that had been operated by Dr. Rochet in November, 1905.

Shortly afterward Drs. Claude Martin and Sargnon insisted upon the value of elastic dilation by means of rubber tubes in chronic cases of stenosis of the larynx and trachea, after having tested the method in the cases of three children, two of whom we shall mention.

At the end of the same year Dr. Barlatier presented to the Medical Society of Lyons the child with sub-glottic stenosis that Dr. Rabot had treated and presented six months previously. Dr. Sargnon reported than an autoplastic had been performed to close the laryngeal fistula after having inserted a Killian T drain of 8 mm. in diameter. At the same time he recommended laryngostomy in recurring papilloma and in certain forms of tuberculosis, notably in the budding and lupus form where the laryngeal lesion is not extensive.

This method permits an energetic local treatment. Recently Drs. Barlatier and Sargnon have again taken up this question and claim that they know thus far but three cases of Killian, two of Pieniazek and six cases in Lyons, of which five were operated by Drs. Rabot, Rochet and Vignard, and a sixth by Dr. Collet during 1906.

In May, 1907, Drs. Sargnon and Barlatier presented to the Société Francaise de Laryngologie the work upon Laryngostomy, in treatment of stenosis of the larynx. The five operations which they report were performed in November, 1905, by Drs. Rochet, Garel and Rabot; (2) in April, 1906, by Drs. Rabot and Sargnon; (3) in January, 1907; (4) in March, 1907, by Drs. Vignard and Sargnon; (5) in April, 1907, by Drs. Garel, Sargnon and Bonnamour.

Since then Dr. Sargnon operated upon a young girl already wearing a tube whom Dr. Marfan had treated unsuccessfully with internal dilatation at the Children's Hospital of Paris. This patient again wears a drainage tube, with which she could dispense, were it not for the fear of asphyxiation, which seizes her as soon as the canula is removed. Very shortly she will be ready for a plastic of the larynx.

Dr. Sargnon reports with Dr. Hau of Villefranche, the case of a child of six years upon whom laryngostomy was performed for total stenosis involving 4 cm. extending from the trachea through the thyroid and cricoid to the vocal cords.

Dr. Collet performed this operation for a cicatrix of the cricoid.

Another such operation was done at St. Etienne by Drs. Viannay, Descos and Deygas.

At the last meeting of the Italian Laryngological Congress in October, 1907, Dr. Canepele[12] cited the first operation of Ruggi, which was published by Nasi[1] and mentioned two others by the same author as well as one of his own. During the discussion Drs. Melzi and Cagnola of Milan, reported two recent successful results obtained by them in two cases of laryngo-tracheal stenosis.

OPERATION.

The procedure employed by Killian is the one most generally accepted. The operation is divided into four steps. 1st. Laryngo-fissure. 2d. Dilatation and dressing. 3d. Auto-plastic. 4th. The maintenance of a provisional opening in the trachea. Drs. Sargnon and Barlatier, who had charge of most of the cases at Lyons, have perfected the second step by a method quite original with them and it is really the second step which is of most importance in this operation.

Laryngo-fissure—The laryngotomy may be total or partial, depending upon the necessity of a high tracheotomy or an inter-crico thyrotomy. At all events a laryngo-tracheotomy is performed. If the tracheotomy is very low a tracheal bridge is left intact above the canula. It is of the utmost importance not to undertake the operation when there are febrile or pulmonary disturbances, for fatal complications may ensue.

As anesthetic, ethyl bromide, chloroform, or, better still, local anesthesia, with the following Schleich solution is suggested:

R.

Cocain Hydrochlorat	Grms. 20.
Morphin Hydrochlorat	.025
Sodii Chlorid	.20
Acid Carbolic (5 per cent Aqueous Sol.)	Gtts. 2.
Aq. Destil	100.

Two or three cc. are injected one-quarter of an hour before the operation. The patient in the Rose position is placed with head hanging low over the bed. An incision is then made, long enough to perform either a laryngostomy or tracheotomy; then the cellular tissue is divided, also the aponeuroses of the muscles and of the thyroid body in case of a very low tracheotomy; then the anterior surface of the trachea above the canula is exposed. After carefully controlling the bleeding the canula is removed, and with a probe-tipped bistoury the trachea, the cricoid and thyroid are incised along the median line, taking care not to pass beyond the superior border of the thyroid. If a bridge is left above the canula, a puncture is made below the thyroid or the intercrico-thyroid, and a fenestra is made with scissors or bistoury. This division of cartilage, especially of the cricoid, often presents great difficulties considering the tendency of this cartilage to ossify and to fill the larynx with cicatricial tissue. It is also necessary to resort alternatively to the scissors, the probe and the tracheal sound in order to make an artificial passage through this tracheal sound in order to make an artificial passage through this deformed area. The hemorrhage is controlled with hydrogen-peroxide; sometimes the tracheal canula must be replaced. However, if the anterior surface of the larynx and trachea have been carefully denuded there is little bleeding and an application to the mucosa of the larynx of a piece of gauze slightly moistened with the following solution suffices:

R.

Cocain Hydrochlorat	Grms. 1
Aqua Steril	20.
Sol. Adrenalin (1-1000)	20.

Using the electric head lamp for illumination, an opening is made along the median line of the entire cicatricial tissues as far as the posterior wall of the larynx, taking care not to injure the esophagus; it is not necessary to remove the cicatricial tissue as this does not suppurate when in contact with the rubber drain. This tissue may, however, be destroyed by gangrenous infection, probably of buccal origin, as was recently demonstrated by Drs. Vignard, Sargnon and Barlatier. For this reason it is necessary to make but one opening along the median line in which to place the rubber drain.

Sutures of mucosa, cartilage and skin are then made and when necessary because of stenosis, additional sutures are taken through the lateral cicatrices.

As suggested by Drs. Beco and Vignard, it is preferable to use a strong silk ligature rather than silver wire and to make deep sutures through cartilage, muscles and skin, at a sufficient distance from the cut edges. Three or four sutures are necessary.

The cleansing of the parts is completed, and the patient instructed to cough up the mucus and blood. The canula is then replaced.

Dr. Jabot recommends the use of a Krishaber canula which has a tent-like, slanting space on top while the point of attachment of the inner tube is situated in this tent-line space.

The red rubber drain is then inserted, which at the outset in the case of a child should vary from 4 to 6 cm. and range in diameter from no. 15 to no. 20 (French), depending upon the degree of contraction.

One end of the drain is shaped like the mouthpiece of a flute with its sides rounded, and this is easily done by passing it over a flame. To keep the drain in place, a silk thread is passed about the center and its shortest part. In order to prevent the passage of food and liquids into the trachea, the drainage tube is tightly plugged with gauze for at least a month. Drs. Barlatier and Sargnon advise the use of vaseline with the drain. This makes it easier for the patient to wear the drain and at the same time the vaseline moistens the laryngeal cavity, facilitates the softening of the cicatricial tissues and prevents the formation of ulcerations resulting from pressure. Above, the drain should not extend beyond the superior border of the arytenoids.

The drainage tube is fastened to the Krishaber canula. The gauze, well saturated with vaseline, is then applied to prevent the sides of the wound from sticking to one another. The gauze is placed between the walls and the drain-tube and care must be taken that the gauze reaches as far as the superior angle. All this is again covered with sterilized gauze and cotton, which will absorb the secretions that are usually plentiful. A gauze bandage keeps the dressing in place.

The patient reclines with his head lowered a little. The canula is cleansed every hour during the first few days. The dressings are removed daily and if they are fetid, they are changed morning and evening. During two or three days the patient has only liquid and semi-liquid food, which is taken from the spoon, feeding cup or glass tube.

During the first week pulmonary and bronchial complications are apt to occur. The temperature must be watched; it becomes normal when sloughing ceases.

2. Dilatation.

Dilatation is now begun and must be slow and progressive. Every second day the drain is changed because it becomes fetid; at the end of a month the drain may be left in place for two or three days, then four, five or six days, depending upon the amount and fetidness of the discharge; care must be taken each time a new drain is inserted that the original length is preserved, if it is not at the end of the period of dilatation; at that time a shorter drain may be inserted, which should always be coated with vaseline, and attached to the rings of the canula. If in certain cases at almost every change of the drain, one of a large diameter may be inserted, it is still necessary to remark that by a too rapid dilatation, a superficial gangrene of the new mucosa sometimes occurs. It requires several months to proceed from no. 15 to no. 30. (French.)

From the third day following the operation, the mucous membrane is red, swollen, and covered with purulent mucous, and the cicatricial tissues assume a grayish white color, indicating that these parts have softened and sloughed. At the time of each dressing it is necessary to carefully remove the sloughed tissues with tampons moistened with hydrogen peroxide, and to prevent the closing of the superior parts of the wound by means of the vaseline-covered gauze, a process which has already been described. The stitches are removed about the fifth day. At the end of a week, at the base of the wound, a reddish tissue covered with granulations may be seen. This budding lasts about one month. The cicatricial tissue then begins to disappear, the larynx and the trachea begin to assume a regular caliber; the mucosa is less mushy, and the edges of the wound are covered with skin from without toward within. The dressings which until now have been made daily and every other day, are changed every second and third day. It is necessary to notice carefully the epidermization, that must come about regularly, and for this reason, at the very edge of the skin formation the granulation tissue is touched up with nitrate of silver, as is the tracheal spur when it obstructs the light in the canal. To avoid a closure of the wound superiorally, Dr. Sargnon advises a separation of the sides at each dressing in order to insert the drain well and to pack in tightly the vaseline-covered gauze to the very level of the superior angle. If the closure is inevitable, it can be remedied by the bistoury under local anaesthesia. During the process of epidermization the drain must be introduced from below upward between the vocal cords. The secretions diminish; the epidermized mucosa becomes supple, solid and less red, the skin tends to re-enter the laryngotracheal tract, while the cartilage reforms. The patient can be left momentarily without the canula and drain, in the meantime closing the fistula with gauze, and replacing the drain stuffed with gauze by a drain which is not closed. The patient begins to breathe without a drain (which ought to be about the size of no. 30, French), through the fenestrated canula, which he now wears in place of the Krishaber tube. When the patient is able to breathe for a certain length of time through the mouth, except during the night, the canula may be removed and the opportunity for an autoplastic is at hand.

3. The Autoplastic.

An autoplastic is indicated because of the possibility of the wound-surfaces uniting after cauterization, or after freshening the edges of same.

Following the method of Dr. Larrey, two little flaps are detached from the sides of the fistula. These are brought back to the median line over the fistula where they are sutured, or better yet, the procedure of Nélaton[10] is employed.

Two curved flaps are made to close this fistula, one taken from above, and the other from below the border of the fistula. The flaps are made of sufficient length so that the edges may meet over the fistula. The skin along the lateral walls of the fistula is loosened and the edges freshened and drawn by several sutures to meet in the median line so that it may be super-imposed over the flaps just made. Killian's method does not differ much from the foregoing. It consists of two vertical lateral incisions several cc. distant from the median line, an incision along the two sides of the wound which is freshened, except at the orifice of the canula.

Where there is a lack of tissue, the flap is made from the adjacent cartilage. In order not to destroy too much tissue, a part of the original incision is allowed to close. The rubber T drain recommended by Killian is then inserted, care being taken to place the vertical part in the trachea and the horizontal portion in the tracheal orifice, after which the tracheal fistula is closed by sutures along the median line, taken both deeply and superficially. The deep sutures are made with catgut; the other with wire. In cases of large dilatation, the Killian drain can be dispensed with, keeping a tracheal opening for safety's sake in which an extremely small canula is placed.

4. The provisional tracheal opening maintained for safety's sake:

The patient must be carefully watched. In case of accident, owing to the maintenance of the opening, the tracheal orifice can easily be dilated, by gently pulling at the skin at each side and, when necessary, by introducing into the trachea, following the method of Pieniazek, a drain rounded at each end and kept in place by safety pins; or, better still, a soft rubber canula made by Reiner of Vienna, may be used as suggested by Pieniazek. A simpler procedure is that employed by Dr. Sargnon, who uses a canula which along its ends is straight and slightly curved in the middle. If at the end of several weeks no respiratory disturbance has set in, the opening is allowed to close; if necessary, the edges are freshened up.

Among the sixteen or seventeen cases thus far reported, inclusive of the reports of Jaboulay and Beco, but one death has resulted from gangrene and in only one case reported by Jaboulay did the cicatricial tissue reform, but in this case, the rubber drain was not used.

The lengthy treatment, which, in course of time will be improved, the possibility of bronchial and pulmonary complications during the first few days, the displacement and obstruction of the drain, the formation of tissue, the restlessness of the patient, the loss of timbre in the voice, which is heard as a whisper, though entirely intelligible, are inconveniences which, to a large extent, will be remedied. The advantages of laryngostomy make it a procedure of great benefit in serious cases of stricture of the larynx in patients wearing a canula, as well as in some forms of laryngeal tuberculosis that require energetic local treatment, where endo-laryngeal medication cannot be tolerated, also in recurring cases of papilloma, which, up to this time, have been treated by laryngo-fissure and in those cases of malignant tumors, mentioned by Dr. Grossmann.

If this operation requires long and delicate after-treatment, there is ample recompense in the constant general improvement in the patient, in the re-establishment of the respiratory functions, which no longer necessitates the use of the canula, that of itself is often the cause of fatal results.

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A woman 58 years old had aspirated two pieces of bone; the accident was followed by a foetid bronchitis. Two months later the author removed the foreign bodies by direct bronchoscopy under local anesthesia. The operation was complicated by the large quantity of pus which continually enfered the tube during the manipulations. The patient made a complete recovery.

Yankauer.

FIBROMA OF THE TRACHEA.*

BY WILLIAM E. SAUER, M.D., ST. LOUIS.

Fibromata as well as other new growths of the trachea, are not common occurrences. The majority of our American text books of the diseases of the nose and throat make no mention of them. Von Bruns, in his article on the neoplasms of the trachea in Hymann's Handbuch der Laryngologie und Rhinologie, states that tumors of the trachea are comparatively rare. He found among his records 300 laryngeal, and only 7 tracheal tumors. His review of the reported cases shows only 102 benign, and 45 malignant neoplasms of the trachea. Schech states in his Krankheiten der Kehlkopfes u. d. Luftröhre, that new growths of the trachea may be classified as rare diseases. Moritz Schmidt found among 58,879 nose and throat patients which had come under his observation during 18 years, only 7 new growths in the trachea. Semon found among his classified reports of 10,000 benign laryngeal neoplasms, only one tracheal tumor to every 100 laryngeal. The case which I shall here relate is therefore deemed to be of sufficient interest to report in detail.

Charles B., age 74, a retired police officer, born in Germany, was referred to me on Jan. 6, 1906. He had always enjoyed good health with the one exception, that he had had some trouble with his right eye, which was removed in 1882. (I learned later that this was a sarcoma of the conjunctiva; the enucleation had been performed by Dr. Alt of St. Louis.) Since that time he had always enjoyed good health.

The family history is negative. For the past 5 or 6 months he had been more or less annoyed by an irritative cough, but this had not disturbed him in any degree until about a month ago, when the cough began to annoy him when lying down. He also noticed that there was considerable difficulty in breathing and he would become very short of breath when walking up a flight of stairs. He consulted his family physician, who diagnosed his trouble as a chronic bronchitis. The patient was given small doses of potassium iodide, but his cough became more aggravated, disturbing him greatly at night. The breathing became more difficult, and at times it seemed as though he could scarcely breathe at all. On examination I found him to be well nourished, weighing about 180 pounds.

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He claimed not to have lost any weight. The respirations were distinctly audible, and stertorous in character; his voice was somewhat hoarse. The slightest exertion brought on an attack of dyspnoea. The laryngoscopic examination revealed nothing abnormal in the larynx; but in the trachea a mass could be distinctly seen situated just above the bifurcation on the anterior wall; occupying at least two-thirds of the lumen of the trachea. The surface of the tumor was uneven and appeared somewhat pale. Considering the age of the patient and the appearance of the tumor. I suspected it to be malignant. I observed the patient for a few weeks and made repeated examinations; I also attempted to make a direct examination with the Killian tracheoscope, but found that the patient could not stand this examination. During this time the cough had been getting more severe and the breathing more embarrassed; even the slighest exertion brought on an attack of dyspnoea. The patient found that he could rest more comfortably when lying on the abdomen. I had been seriously considering an attempt at removal of the growth under a general and local anaesthesia, but was deterred from this upon the advice of the internist who saw the case with me. He strongly advised against any operative interference owing to the advanced age of the patient and the presence of a well-marked myocarditis. The dyspnoea became so alarming and the patient was beginning to be very nervous, and insisted on having something done.

He was sent to the hospital and on Feb. 12th a low tracheotomy was performed under primary chloroform anaesthesia. While on the table it was very difficult for the patient to breathe, and the tracheotomy had to be performed very hurriedly. After the trachea had been incised the respirations suddenly ceased and the patient became pulseless, and markedly cyanotic. Knowing that the obstruction was low down in the trachea, I quickly introduced a Killian bronchoscopic tube into the trachea, with the idea of passing the obstruction, so as to allow the air to pass through the tube. As soon as the tube had reached the vicinity of the bifurcation there was a sudden expiratory effort, and a portion of the growth was expelled through the tube; a second mass quickly followed. The patient began to breathe and the cyanosis began to disappear. Heart stimulants were administered and the pulse could be felt at the wrist. After a few minutes the patient's condition was fairly good. I attempted to get a view into the trachea, but owing to the rather profuse hemorrhage this was impossible. I then withdrew the tube and the hemorrhage gradually ceased. The patient developed a small pneumonic patch in the right lower lobe, which cleared up in about two weeks. There was a marked improvement in the breathing, and there was no dyspnoea; the tracheotomy wound was allowed to close. The patient soon regained his former health.

The method of procedure I had intended to follow was to introduce a Killian tube down to the mass and remove it with a cold snare, which I had had made for the purpose; or failing in this I intended to remove it piecemeal with the biting forceps of Killian. The two masses which were expelled through the tube were about 1½ cm. long by ½ cm. thick. They were cherry red, and had the macroscopic appearance of a papilloma. They were given to the pathologist, Dr. Gradwohl, who reports as follows:

"I beg to report that microscopical examination of the growth removed from the trachea submitted to me by you fails to reveal any signs of malignancy. The growth appears to be a simple polypus covered with normal mucous membrane, and showing a very slight amount of round cell infiltration. Fibrous tissue predominates in it. I made sections from three different places, all showing about the same picture. A slight deposit of hemosiderin was observed in some places."

The patient left the hospital on March 4th. An examination revealed that there was still a mass on the anterior wall of the trachea, occupying nearly one-half of its lumen. The patient claimed that he felt no inconvenience and there was no shortness of breath, even after exertion. A month later I noticed that there was a slight increase in the size of the growth, and it appeared to be extending upward along the anterior wall, but not encroaching on more than half the lumen of the trachea. The general health of the patient is surprisingly good. On December 28, the patient again returned stating that he had noticed during the last few weeks, after an exposure, that there was considerable difficulty in breathing, especially at night. The examination showed that there had been a considerable increase in the size of the growth, and that the upper portion of the growth seemed to have extended up as far as the 5th or 6th ring, and occupied more than half the lumen of the trachea. An examination of the chest reveals an acute bronchitis. The patient was given a sedative, and when I saw him on Jan. 3, there was a decided improvement both in the cough and the breathing, although there was no noticeable change in the trachea. At the present time the patient weighs nearly 200 pounds.

Von Brun's review of the literature in 1898 shows that up to that time, only 23 cases of fibromata of the trachea have been recorded. Since that time only 6 cases have been added to this list; including the case I have just reported, making 29 in all. I shall review these cases briefly, in the chronological order of their report.

CASE 1. The first fibroma which is also the first new growth of the trachea recorded, is the case reported by Lieutaud, in 1767. The case was that of a boy, in which a polypus with a long pedicle, having its origin in the trachea, had been carried into the glottis by the expiratory air current, causing sudden death.

CASE 2. Stallard reports the case of a man aged 40 years, admitted to the hospital April 25, 1843, in a condition of general weakness, with symptoms of bronchitis. He had been asthmatic a long time. Patient died four days after entering the hospital after a fit of coughing which lasted an hour. Autopsy showed emphysema of the lungs. The bronchioles were healthy, but the right and left divisions of the trachea were congested. In the trachea there was a polypus about the size of an almond.

CASE 3. Reported by Rokitansky. Patient female, age 35 years; mother of two children. Had noticed a change of voice for 4 or 5 years, and finally at intervals lost her voice entirely. In March, 1844, had a spell of suffocation; there was dyspnoea and pain upon making an effort to cough. A polyp was discovered between the cords and another further down in the trachea. A tracheotomy was performed and a canula was inserted; the patient made a good recovery but the voice remained the same. A few months later the patient died of a follicular enteritis. Autopsy showed that the original fibroid had been attached to the trachea just below the larynx.

CASE 4. Smoler reports a case, male, age 22, well nourished. Some years before had had an attack of catarrhal pneumonia during which, hemoptysis with febrile symptoms had occurred. Later on these symptoms were reproduced without any apparent cause. The patient was almost constantly suffering from asthma; an examination of the lungs by percussion revealed a tympanic sound in the right clavicular region. Auscultation revealed some rales; the heart was hypertrophied, the abdominal organs were normal. There was short breathing and palpitation when ascending stairs. Violent fits of coughing, cyanosis, and sweats with purulent expectoration. Patient has a good tenor voice and was able to sing. Parents had died of "lung disease" at advanced age. Autopsy, lungs filled with reddish brown fluid; no evidence of tuberculosis. Bronchi dilated and filled with fluid. Heart cavities slightly dilated. The finger introduced into the trachea encounters a tumor the size of a large nut, which completely obstructed the organ. It has a broad base and extends from the 1st to the 7th cartilage. Diagnosis: Fibroma of the trachea, confirmed by microscopic examination.

CASE 5. Reported by Fifield. The patient was first seen at her confinement in 1857, then 16 years old and healthy. Father asthmatic. Two years later began to have attacks of asthma, which increased in severity until January, 1860, when well marked symptoms of hysteria developed. The asthmatic paroxysms were remarkably severe. In March of the same year there was severe cough with bloody expectoration. Bronchial rales were heard all over the chest and the case was diagnosed as a tubercular condition. For several months the patient had not been able to lie down, but slept in chairs. On August 20, 1860, she developed measles, after which she remained in better health through the winter and spring. In July, 1861, the patient began to lose ground rapidly. She became very pale, dyspnoea became more marked and the feet and ankles were swollen. Auscultation showed besides the usual rales a well marked "bruit de diable" in the neck. Patient died on July 14, 1861. The autopsy showed, the heart healthy, lungs free from tuberculosis; no emphysema. The right bronchus presented superficial erosions. The smaller divisions were filled with semipurulent mucus. Upon examining the left bronchus the opening could not be found at first. It was perfectly covered by a firm rosy polypus the size of a small grape. The pedicle was attached to the trachea at the mouth of the bronchus, acting as a ball valve, allowing expiration but forbidding inspiration.

CASE 6. Tuerck had observed a patient, age 37, in private practice. There had been little difficulty in breathing. The patient died of pythisis. The autopsy revealed a tumor 6 mm. long, by 2 to 4 mm. thick, situated in the upper part of the trachea attached to the posterior wall. The diagnosis was confirmed by the microscope.

CASE 7. Reported by Gerhardt. Female, age 34. Never had any respiratory difficulty. In November, 1864, the patient died of acute yellow atrophy of the liver. At the autopsy there was found situated above the bifurcation at the level of the 8th ring somewhat to the left, a small polyp ¼ cm. wide, by 1 cm. long.

CASE 8. Also reported by Gerhardt. A girl aged 25 was first observed in 1853. The first symptoms noticed were a shortness of breath, which gradually increased; followed two weeks later by a cough. In the middle of October her breathing was much embarrassed. She was compelled to go to bed; keeping the upper part of her body elevated. She complained of pain in the breast and right side of the neck. The voice was deep and hoarse. A laryngoscopic examination in March revealed a reddish tumor in the trachea near the 6th ring on the left side, only a small space was left for respiration. On March 29 a sound was passed. The breathing became more labored and the cough aggravated. On March 31, the dyspnoea increased, with cyanosis and bloody expectoration. Her condition grew worse and she finally died April 5th. The autopsy showed an acute bronchitis, emphysema of the lungs and some oedema. The tumor was 3 cm. long, by 1½ cm. wide; the pedicle was 2 cm. in length.

Mackenzie reports the following four cases of tracheal fibromata:

Case 9. Male, aged 41, entered hospital in March, 1865, with hoarseness and slight dyspnoea. The larynx was found congested, and was treated with astringents. On October 16th a growth was seen about the size of a bean, occupying the 2nd and 3rd ring of the trachea. In November several unsuccessful attempts to remove it with a forceps were made, but on December 21, 1865, the growth was touched with electric cautery; one week later no sign of it could be seen.

Case 10. Female, age 10. First applied at hospital suffering from dyspnoea and weakness of voice. A growth about the size of a pea was seen on the 3rd ring of the trachea, rather to the left side of the median line. On attempting to remove the growth with the cautery, the patient moved and both cords were injured. The patient did not return for further treatment.

Case 11. Age 37, was seen in March, 1874. He was suffering from dyspnoea and hoarseness. A growth was seen just above the anterior commissure, which was removed with the forceps; a growth about the size of a currant was then seen occupying the 1st and 2nd ring of the trachea. The cricoid cartilage could be distinctly seen above it. After two failures the polyp was touched with the galvano-cautery; a week later no sign of it was seen.

Case 12. Male, aged 45, applies at the hospital on June 15, 1876, suffering from dyspnoea. A smooth red polyp about the size of a grape was seen covering the 4th, 5th and 6th rings of the trachea. A tracheotomy was proposed but refused. The patient died three months later of apoplexy. No post mortem.

CASE 13. Man, age 63, was first seen by Ingals in 1881, with symptoms of laryngitis. In February, 1883, the author discovered a growth in the trachea 4 to 5 cm. below the larynx. It was sessile and flattened in form, standing out from the surface of the trachea about 5 mm. and occupying an area ranging from 8 to 12 mm. in its various diameters. It was of a reddish color and granular. There was no inconvenience in breathing and no noticeable size of the tumor when seen six months later. There was no attempt at removal.

CASE 14. Reported by Stoerk. This case was that of a midwife 40 years of age, who had difficulty in breathing. A laryngeal examination revealed a fibroma the size of a bean in the upper part of the trachea. The patient refused a tracheotomy, so was allowed to go without further treatment.

CASE 15. This case, reported by Masini, has been considered a typical one. It was a fibro-myxoma situated upon the 1st ring of the trachea and on phonation could be seen below the cords. It was extirpated through the mouth with a modified Mackenzie's forceps under cocaine anaesthesia.

CASE 16. Lewin presented a patient who had been wearing a tracheotomy tube for 24 years. The patient had always been perspiring, coughing and subject to fits of suffocation. The laryngoscopic examination revealed a redness and swelling of the vocal cords and a fibroid tumor which grew out from the posterior wall of the trachea. After the tracheotomy the patient showed great improvement, could speak well and breathe well. Further operation was refused by the patient.

CASE 17. Langlet mentions a case of a man, age 60, who was seen in 1886 with marked symptoms of obstruction, cough and pain on swallowing. He also complained of a feeling of foreign body. The voice was hoarse. Auscultation revealed generalized mucous rales. No abnormal signs were detected by percussion. The patient was given jaborandi in two gram doses, which seemed to relieve him for a time. A laryngoscopic examination showed no foreign body nor tumor of the vocal cord. The patient began to have severe attacks of suffocation and succumbed July 14, 1886. The autopsy showed a small white lobulated tumor the size of a small nut 3 cm. above the bifurcation of the bronchus. A part of this tumor had become detached and fixed itself in the larynx, causing a rapid asphyxia.

CASE 18. Braun reports a case, male, age 40, sent to the author in February, 1889, by Dr. Escher with a diagnosis of tracheal polypus complicated with laryngeal troubles. The history showed that the patient had been hoarse for ten years without any other noteworthy symptoms. He began to have a feeling of pressure in the throat, constant coughing and dsypnoea when lying down or sleeping. The hereditary history of the patient was negative. Inspection showed a short thick neck "and highly arched tongue." The opening of the larynx was narrow, the breathing was labored. Upon deep inspiration it was possible to see a thick white tumor 1 cm. below the anterior commissure, which moved backwards and forwards. It was found that a 20 per cent solution of cocaine not only would not anaesthetize the growth but produce hyperaesthesia. Five weeks later the author removed the growth with a forceps. The patient made an uneventful recovery and there was no recurrence.

CASE 19. Reported by Oazmann, in which a polypus of the larynx and of the trachea was extirpated at one time. This was followed by a recurrence. Laryngotomy and cauterization were next done; this was also followed by a recurrence. The removal was then made through the mouth and the patient given potassium iodide internally. No recurrence after five years. The age not stated.

CASE 20. Bidwell showed to the Pathological Society of London a specimen of a fibroid polypus of the trachea. It was taken from a boy five years of age who died from asphyxia at the Evelina Hospital for Children. The polypus was the size of a small marble and was attached to the posterior wall of the trachea by a distinct pedicle. On microscopic examination the growth was found to consist of fibrous and cellular elements without any distinct evidence of sarcoma, except that some of the nuclei appeared to be becoming spindle shaped. There was no sign of disease in any other organ; the child had suffered from symptoms for fourteen days and tracheotomy had been performed without relief two days before death. This was the first case of fibroid polypus of the trachea shown to the Society.

CASE 21. Avellis reports a case, male, 50 years of age, who had been suffering for a long time with a large struma and marked difficulty in breathing. The author was called because the patient had coughed up some blood. Pharynx and nose hyperemic. The left vocal cord was paralyzed and fixed. The larynx was markedly scoliotic, and the trachea involved lower down. The author discovered a body which moved upon breathing but an accurate examination could not be made. The source of the hemorrhage was not discovered. A few days later the patient developed symptoms of pneumonia. The autopsy showed that the left vocal cord was somewhat atropic and fibrous. Near the 7th and 8th tracheal ring the polypus was seen; it was like the whole of the tracheal mucosa, somewhat red, not bleeding and could be moved easily by the sound. Later examination revealed a beginning sarcoma.

CASE 22. Krieg in his Atlas der Kehlkopfkrankheiten gives an illustration in which a fibroma situated just above the bifurcation on the posterior wall of the trachea almost obstructs the entire lumen. I was unable to find anything further regarding the case.

CASE 23. Schmidt in speaking of fibroma of the trachea in his Krankheiten der obern Luftwege refers to Tuerk's and Stoerk's cases, and then states that Boeckenheimer had seen a lymphofibroma in the trachea which was operated upon with good results.

CASE 24. Eppinger reports the case of a man aged 23 who had died suddenly; a round tumor as large as a hazel nut was found on the posterior wall of the trachea 4 to 5 cm above the bifurcation. The diagnosis was verified by the microscope.

CASE 25. Jurasz reported a case of a male, age 38 years, who had been suffering from hoarseness of a slight degree for more than a year, but which in the last two months had become troublesome. The breathing was somewhat impaired. On laryngoscopic examination a polypus the size of a small hazel nut could be seen which had its origin in the trachea. The growth moved with each inspiration and expiration. No attempt at removal had been made.

CASE 26. Rosenfeld mentions a case in which a polyp the size of a pea, had its origin on the anterior wall of the left bronchus, and after an attack of coughing could be seen lying over the bifurcation.

Case 27. Ogle reports a case of a child one and one-half years of age, admitted to the hospital apparently in good health, who was readmitted the same day with dyspnoea. The mother said the patient had several "spells of short breathing" on the way home. A second tracheotomy was done and the patient died. A tumor was found attached by a pedicle at the site of the first tracheotomy. The author believes that the asphyxia might have been due to a cold after leaving the hospital; or it might have been due to a spasm. The tumor seems to have been a fibroma.

CASE 28. Marcel and Zigura report a case of fibroma of the trachea in a patient aged 33. The tumor was the size of a hazel nut.

It was removed and no recurrance followed. The tumor was examined by Babes, and pronounced "a typical fibroma."

An analysis of the reported cases shows that fibromata may be found at all ages. One patient was below 2 years; three patients between 5 and 15; three between 20 and 30; seven between 30 and 40; three between 40 and 50; two between 60 and 70, and one over 70; in eight the age was not stated. The sexes are about equally divided. Eleven of the cases were males, and seven females, and in ten the sex was not recorded.

The size of the growths varies from that of a small pea to that of a large nut. In the case of Smoler, the growth completely obstructed the trachea. The location of the tumors was also a variable one, as they were found in all parts of the trachea. In one of Mackenzie's cases the growth was attached to the first ring of the trachea. In Rosenfeld's case the origin of the growth was in the left bronchus.

The symptoms varied from a slight hoarseness, weakness of voice, cough, dyspnoea, asthmatic symptoms, attacks of suffocation and asphyxia, ending in death. In nine of these cases death had occurred from suffocation. The amount of disturbance depends on the size and location of the growth. In Langlet's case there was a feeling of foreign body which the patient attempted to cough up; this cough was followed by spells of suffocation. In Rokitansky's case there was pain in the chest on coughing. In Smoler's case there were symptoms of catarrhal pneumonia without fever; these attacks were brought on without any apparent cause. In Braun's case there was hoarseness for ten years without any other symptoms. Fifield's case showed marked asthmatic symptoms for more than three years and the case was believed to be tuberculosis. In Ingal's case, a growth situated 5 cm. below the larynx and extending 5 mm. out from the surface of the trachea and occupying an area varying from 8 to 12 mm. in its various diameters, produced no symptoms. In four cases reported by Mackenzie the growths varied in size from a small pea to a grape. In all the cases there was a noticeable dyspnoea with hoarseness.

A positive clinical diagnosis was made in sixteen of these cases; the others were diagnosed on the post mortem table. Five of the cases were recorded before the discovery of the laryngoscope; these were diagnosed at the autopsy. Tuerck was the first to see a tracheal growth in the laryngeal mirror. With the further development of the direct methods of examination more of these cases will be recorded.

A histological examination was made in only nine of the cases. In Ogle's case the growth had its origin at the site of the tracheotomy wound, and as a histological examination was not made this case was in all likelihood a granulation tumor, and not a true new growth. In the case of Avellis a beginning sarcoma was discovered later. In Bidwell's case some of the nuclei appeared to be becoming spindle shaped. This seems to bear out the statement of Proebsting that no conclusions should be drawn from a macroscopic appearance of these tracheal growths. He reports a case in which a polyp with a small pedicle had been coughed up and brought to him by the patient. Proebsting could distinctly see the remaining portion of the pedicle in the trachea. The macroscopic appearance was that of a typical mucous polyp; a microscopic examination, however, revealed carcinomatous elements in the interior of the polyp. The patient died nine months later of carcinoma of the trachea and left lung. In the case reported above by me, sections were made by four different pathologists, and no evidence of malignancy was found in any of the slides examined.

Attempts at removal were made in only six of the cases. In Braun's and Massini's cases the growths were removed through the mouth by forceps; they were situated high up in the trachea. In Oazmann's case the growth was first removed with the forceps through the mouth. A recurrence followed. A thyrotomy was done followed by a second recurrence. A third removal was made through the mouth and proved to be successful. In two of Mackenzie's cases the growths were destroyed by the galvano-cautery. In one case reported by Mackenzie the vocal cords were injured in attempting to cauterize the growth; further attempts were then refused. In Lewin's and Ogle's cases a tracheotomy was done, but no attempts at removal were made. In Gerhardt's case a sound was introduced into the trachea; death followed several days later. In my own case a partial removal was done with relief for eleven months. The patient is still quite comfortable.

Regarding the prognosis of these tumors, the cases of Proebsting and Avellis should again be borne in mind, and a careful microscopic examination should not be neglected, even when the macroscopic appearances are typical. A great advance in the operative technic of these cases has been made through the development of tracheoscopy and bronchoscopy, as done by Killian and others. With the aid of these the removal of the growths situated low down in the trachea or even in the bronchi themselves is no longer an impossibility.

Humboldt Building.

DO WE HEAR OURSELVES AS OTHERS HEAR US.*

BY G. HUDSON-MAKUEN, M.D., PHILADELPHIA, PA.

The faculty of hearing in so far as it relates to the faculty of speech may be divided into two classes, subjective hearing and objective hearing. By the former is meant the hearing for one's own speech at the time of its production by the natural organs, and by the latter is meant the hearing for the speech of others and the reproduction of one's own speech as in the phonograph.

That there should be a difference in these two classes of hearing is apparent when we consider their physiology. In subjective hearing, the sound waves are received not only through the external auditory canal by air conduction and through the external bones of the head, but also and in large measure directly from the organs of speech through the Eustachian tube and through what may be called internal bone conduction. In objective hearing the sound waves are conducted through the external auditory canal, through the bones of the head and to some extent also, when the nostrils are open, through the Eustachian tube, but the direct effect of the actual vibrations in the laryngeal, oral and nasal cavities so manifest in subjective hearing is entirely lacking.

In addition to these physical differences between subjective and objective hearing there is a less tangible, but no less actual psychical difference. A man hears the speech of others with a more or less critical ear, while to his own speech he turns a tolerant and even approving ear. He thus learns not to notice errors in his own speech that he would at once detect in that of others and he learns even to be deceived into thinking that his own mannerisms of speech bear a close resemblance to normal speech. In other words he grows accustomed to his own speech, he is prejudiced in its favor and however faulty it may be it is pleasing to him; and he keeps on talking in the same way.

That there is a purely physical difference between subjective and objective hearing, however, is well illustrated by the hearing of one's speech in the phonograph. The difference is so marked that the objective phonographic reproduction is not generally recognized.

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*Read before the 57th Annual Session of The Medical Society of the State of Pennsylvania, Reading, Pa., Sept. 23-26, 1907.

Actual clinical proof of the fact that we do not hear ourselves as others hear us is not wanting. My attention was first called to it by a case of falsetto voice. The patient had just passed his fifteenth birthday. He was referred to me by a well-known physician, who had tried the various methods of treatment, both systemic and local, but they had no effect whatever upon the condition. With a little assistance in the adjustment of the vocal and respiratory organs the patient was enabled easily to produce single tones having the normal chest resonance, and when I complimented him upon his success he said: "But that is not the way you want me to talk, is it?" and I said "Yes; why not?" He said: "That voice sounds to me harsh and disagreeable," and it was several days before he could become accustomed to the normal chest tones and accept them for the thin piping treble of the falsetto voice.

A striking example of defective speech that was supposed by the individual to be normal, was that of a case that I published some years ago. The boy's speech, at 15 years of age, bore no resemblance to normal speech, but was in all respects like a foreign language. He gave his name and address "Thahti Thou, purti thah thati pahthi," for Alfred Lawrence, 3918 Parrish street, and he gave the days of the week, "Turdi Thahdi, Tudi, Thadi, Bodi, Bahdi, Tahdidah." His mother had learned to translate this jargon, and the boy was entirely unconscious of the fact that it was unlike the language of his fellows, which, by the way, he could understand perfectly, and which he could spell and write with considerable fluency.

Since my experience with these two cases I have examined hundreds of people having similar defects, and I am convinced that no matter what may have been their individual peculiarities of voice and speech, they were entirely unconscious of them and satisfied with their own efforts, until perchance they had been informed of their deficiencies, or their defects had resulted in injuries to the organs employed. This knowledge of a deficiency in voice or speech often comes as a great shock to patients. One small boy of nine who had been told at school that his speech was defective said to his father that he would rather die than not be able to talk as other boys talk.

We do not hear ourselves as others hear us any more than according to the poet we see ourselves as others see us, and so far as our immediate personal happiness is concerned we may be equally fortunate in both cases, but nevertheless the fact must lead us into many an awkward position. The man that persists in talking in the falsetto voice and with stammering speech, although blissfully unconscious of his condition, is quite as ridiculous in the eyes of his fellows as was the woman in the Scottish kirk upon whose beautiful bonnet Robert Burns beheld the "wee lousie," and to paraphrase the poet's lines suggested by this incident, we may say

Oh, wad the power the giftie gie us
To hear oursel's as others hear us!
It wad frea monie a blunder free us,
And foolish notion.

That we do not hear ourselves as others hear us is not only an interesting but a very important fact, especially as bearing upon the training of the voice and the correction of the various forms of defective speech. Good hearing is the natural accompaniment of good speech and defective hearing invariably results in defective speech.

It has not been my purpose in this paper to deal with the inaccuracies of hearing that are due to structural defects or pathologic conditions of the organs, but only to call attention to a peculiar mental freak of hearing that seems to determine in many cases the character of voice and speech, and that must be corrected by educative measures before improvement can take place. It is something like word deafness, but different from it in that the patient is deaf only to certain sounds of his own production, whereas these same sounds when produced by others he hears accurately and well. One using the falsetto voice, for instance, will not endure with any degree of complacency an exact imitation of his method of speaking by another person.

Hearing in its finality is a mental process, and like all mental processes, it is susceptible to training. It is in many respects analagous to the sense of sight. We hear in great measure what we have learned to hear and what we desire or will to hear, and it is of prime importance that we learn to hear ourselves aright, because the inability to do this leads to grave defects of voice and speech.

1627 Walnut street.

AN INTRANASAL METHOD FOR OPENING THE FRONTAL SINUS ESTABLISHING THE LARGEST POSSIBLE DRAINAGE.*

BY R. H. GOOD, M. S., M. D., CHICAGO.

The principal points of advantage in my operation are:

First: The establishment of the largest possible opening from the frontal sinus into the nasal cavity.

Second: The practical impossibility of injuring the dura.

Third: The removal of all the anterior ethmoidal cells to give better drainage; as well as to remove diseased cells which may be associated with frontal sinusitis and to prevent an acute or a chronic ethmoiditis following a frontal sinus operation.

Fourth: The possibility of curetting practically the entire sinus and subsequently making topical applications to the mucous membrane in the sinus if necessary.

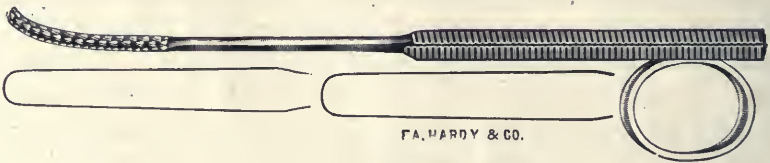

Fig. 1.—Frontal sinus rasp.

The instruments used in this operation are four frontal sinus rasps, right and left; two tapering chisels; three protectors; and long, flexible curets.

The frontal sinus rasp (Fig. 1), is made on the same principle as the old-fashioned coarse horseshoe rasp, from which I derived the idea. It is slightly curved at the rasp end to fit into the frontal sinus and the teeth are on the longitudinally concave surface, pointing toward the handle, so that when traction is made on the rasp, the bone anterior to it is rasped away, as illustrated in Fig. 5. The posterior and orbital surfaces of the rasp are perfectly smooth and flat.

The chisels (Fig. 2) are short, curved and tapering. The handle at the chisel end is very slender so that the chisel may be manipulated under the direct vision of the eye. The corners are tapering as well as blunt, so that if the angle of the chisel should strike a bony surface it would tend to glide off instead of penetrate.

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* Read before the Chicago Laryngological and Otological Society, Feb. 11, 1908.

The protectors (Fig. 3) are made of brass and in three different widths, as illustrated. They can be bent easily into shape on the flat, but not sideways.

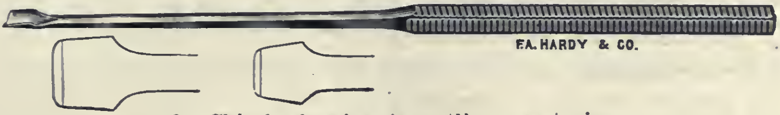
The operation consists of the following steps:

I. The removal of the middle turbinate. This can be separated from its attachment to the ethmoidal labyrinth with a curved knife such as I use in tonsil resections, or with Kyle's nasal saw; and then removed with forceps or snare.

II. The removal of the ethmoidal cells and the unciform process of the ethmoidal bone.

I have found Dr. Ballenger's ethmo-cribriform knife very valuable for separating the ethmoid cells from the cribriform plate. This instrument is introduced into the ethmoidal labyrinth just below the superior turbinate and drawn upward to the floor of the skull and then forward to the frontal sinus.

The unciform process of the ethmoid is removed from its attachment above by first putting a probe into the sinus and then with the larger sized chisel (Fig. 2), the delicate structure can be separated above by simply making pressure on the chisel and at the same time giving it a slight rotary movement. The unciform plate and ethmoidal cells are now removed as thoroughly as possible with biting forceps such as Hartmann's and then curetted out so that they are removed up to the floor of the skull.



2.—Chisel, showing in outline exact size.

II. Chisel off a little of the frontal process of the superior maxilla and separate the anterior medial wall of the ethmoidal labyrinth from its attachment to the frontal spine.

The anterior portion of the medial wall of the ethmoidal labyrinth at its attachment to the frontal spine, being impossible to bite out with forceps can easily be removed with the small chisel.

With the unciform plate out of the way almost any diseased frontal sinus can be probed.

One or two protectors (Fig. 3) are introduced into the sinus and the chisel held as illustrated in Fig. 4.

The chisel is held in a direct line with the protector and under the direct vision of the eye. It is held at a tangent to the orbital wall of the sinus so that it is impossible to injure the cribriform plate as the chisel is directed externally to this structure.

The lachrymal bone and lamina papyracea of the ethmoidal bone are protected by an assistant putting his finger into the orbit who can notify the surgeon if the chisel is touching these structures. As stated above the chisel is held at a tangent to the orbital wall and being curved, with the corners dull, it would tend to lift the orbital periosteum instead of penetrating as the case would be with a sharp-cornered straight chisel.

The internal table of the frontal bone is the important structure to guard against injury, and this is protected first by one or two protectors, past which the chisel cannot go if held in a direct line with it. In the second place there is a considerable distance between the frontal process of the superior maxilla and the internal table of the frontal bone, so that the chisel being firmly held by the hand, loses its momentum before reaching the internal table. In the third place the corners of the chisel are blunt and tapering so that if the corner of the chisel should strike the posterior wall it would tend to glide off instead of penetrate this structure. Again I advise using a very small mallet and make light taps so that one has absolute control of the chisel.

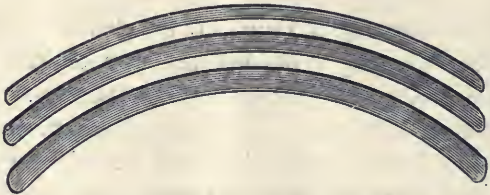


Fig. 3.—Frontal sinus protectors.

IV. Rasping away the lateral aspect of the frontal spine and thereby enlarging the space between the spine and the orbital wall of the sinus.

The rasp (Fig. 1) is introduced into the sinus externally to the frontal spine (not back of the spine, which is impossible), and internally to the orbital wall (Fig. 5). By rasping forward and towards the septum the space between these two structures is enlarged at the expense of the frontal spine. The rasp is perfectly smooth posteriorly so that the internal table cannot be injured, and one lateral or orbital surface of the rasp is smooth to prevent rasping through the orbital wall of the sinus. Care must be taken not to withdraw the rasp too far while rasping, as it will injure the septum.

The structures to be guarded are the lachrymal bone and the lamina papyracea of the ethmoid which is easily done by the surgeon putting his finger into the orbit while rasping.

V. Curetting the sinus if granulation tissue, polypi or tumors are felt in it. The curets must be long and flexible so that all parts of the sinus, except those back of trabeculae, can be reached.

The sinus, in ordinary cases is packed with gauze which is removed the following day, after which the patient is left alone. No matter how large one makes the opening into the sinus, it has a tendency to close, especially in cases with profuse purulent discharge.

In very chronic cases with profuse discharge and polypoid formation it is necessary to put in a tube to keep the ostium from closing with granulations. For this purpose I use a gold-plated tube made of coarse wire cloth as illustrated in Figure 6, which is left in the sinuses for variable lengths of time depending upon the amount of the discharge. The tube being sieve-like allows drainage into the walls of the tube, as well as through the end opening. The rough surface of the tube keeps it in place.

The operation can be performed under local anaesthesia by rubbing adrenalin chloride and crystals of cocain into the olfactory region and by injecting a small quantity of a 10 per cent solution of cocain in adrenalin chloride 1-1000 into the frontal sinus. It is, however, better to put the patient to sleep at the latter part of the operation when the frontal sinus rasp is being used. I operated my last two cases in this way and found it more satisfactory to the patient and myself.

It is necessary to use a Kierstein head-light as the ordinary concave mirrors cannot focus the rays into remote cavities.

The reaction following this operation is very slight, only in one case was there oedema in the region of the inner canthus, and patients who have been suffering with headaches or pain are instantaneously relieved, as illustrated by the following cases:

Case I: Miss F., Chicago, American, twenty-one years of age, and engaged in office work. Eight months before consulting me, patient sat up late on the porch and contracted a cold which was followed two days later by acute frontal sinusitis. During these eight months the patient complained of headaches almost every day. The pain started shortly after rising in the morning and continued for periods varying from one to four hours. She had three acute attacks during this time when her pain would be severe, and her left eyelid would swell so that she could hardly open the eye. During the last attack she was admitted into the Eye and Ear Hospital, where she was treated for iritis with atrophine, according to her statement. After leaving the hospital she was asked to return in a few weeks to have her eyes straightened by a tenotomy. Being afraid of an operaton on her eye, she consulted me Feb. 20, '07.

On examination I found a drooping of the left upper eyelid, which varied in degree according to the severity of the pains. There was a manifest convergent strabismus but no paralysis of any of the muscles of the eye. With Maddox rod test it showed an esophoria of 14 per cent and a right hyperphoria of 5 showing an impairment of function of the superior oblique and the external rectus of the left eye, or in other words, an involvement of the 3rd, 4th and 6th cranial nerves. (I failed to note in this case whether the pupil was dilated, which occurred in two of my cases).

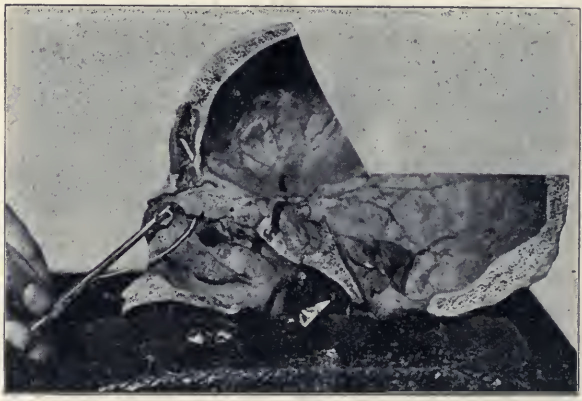


Fig. 4.—Showing chisel and protector in position.

The sinus was very tender on pressure, the pain radiating to the left temple and occiput. Coughing and sneezing increased the pain in the sinus.

On examination of the nose the left nostril was practically obstructed by hypertrophy of both the inferior and middle turbinals and the latter was so large that the septum was pushed to the opposite side. Some secretions were seen under the middle turbinate, which, however, did not appear purulent.

Freer's transillumination lamp showed less illumination of the left than of the right sinus and the X-ray showed a greater density of the left sinus.

Spraying the nose with cocain and adrenalin relieved the patient for ten hours but was of no help thereafter.

Feb. 21st I removed the middle turbinate and passed a catheter into the frontal sinus to make sure that the ostium was patulous. The patient derived no relief from this operation and I allowed her to go for a month or more thinking that it might get well. April 4th I took her to the hospital and performed my frontal sinus operation under local anaesthesia.

Immediately after the operation the patient was relieved of pain, which has not recurred to the present time. Two months after the operation there appeared a polyp in the frontal sinus opening, which I removed and cauterized the base with stick silver nitrate.

The ptosis disappeared one day after the operation and there is only two degrees of esophoria instead of 14, and no hyperphoria.

I kept the patient at the hospital four days as I wanted an accurate record, and the patient kept under careful observation. During these four days the temperature was normal, except at 4 P. M., for the first three days, when it went up to 99. The highest pulse rate was 80. There was possibly the slightest amount of swelling around the inner canthus of the left eye the day following the operation but it was hardly noticeable and the patient was free from pain.

Case II: Mrs. McC., Chicago, forty-three years of age, complained of severe pain in the region of the right frontal sinus for the past six weeks. She consulted a specialist regarding her eyes, who sent her to a neuraligist. She received treatments from the latter for about six weeks but gradually became worse until finally she was confined to bed and called in Dr. C. C. Rogers, who made a probable diagnosis of frontal sinusitis. Having known about my intra-nasal operation, the doctor referred the case to me in preference to operating himself by the external method.

On examination I found a marked ptosis of the right upper lid, paresis of the superior, inferior and internal recti muscles, the pupil was somewhat dilated and sluggish in reaction to light. Pressure over the right sinus caused severe, deep seated pain which radiated to the parietal region. The patient had a diplopia and with Maddox rods showed an exophoria of 16 but there was no hyperphoria.

Examination of the nose showed a deflection of the upper part of the septum to the right so that the middle turbinate was pressed upon. The turbinate was about normal in size and there was no discharge seen under the middle turbinate. With a probe in the sinus a grating could be felt as though there was bare bone in the sinus. The X-ray showed greater density of the right sinus. On April 24, '07, the patient was admitted to the hospital and operated on the following day.

Immediately after the operation the pain left her and she enjoyed a good night's rest, for the first time in six weeks. The ptosis disappeared at the same time. The patient had a normal temperature all the time she was in the hospital except for the first four days, when it raised to 99.4 at 8 p. m. on the first day and 99 at 4 P. M. on the three following days.

After two weeks the patient had lost her diplopia even with the red disc test and she had an exophoria of 2 instead of 16. Her pupil remained slightly dilated but the superior, inferior and internal recti muscles resumed their action. Four weeks after the operation the patient was taken with pain which she described as being deep seated between the eyes and there was a slight oedema above and below the inner canthus of the right eye and a tenderness on pressure over the ethmoidal cells. She had a temperature of 100. I removed some of the anterior ethmoidal cells and the temperature dropped to normal and the pain stopped and the patient was well again. I consider that this was an acute ethmoiditis, so that I now remove the anterior ethmoidal cells at the time of the frontal sinus operation.

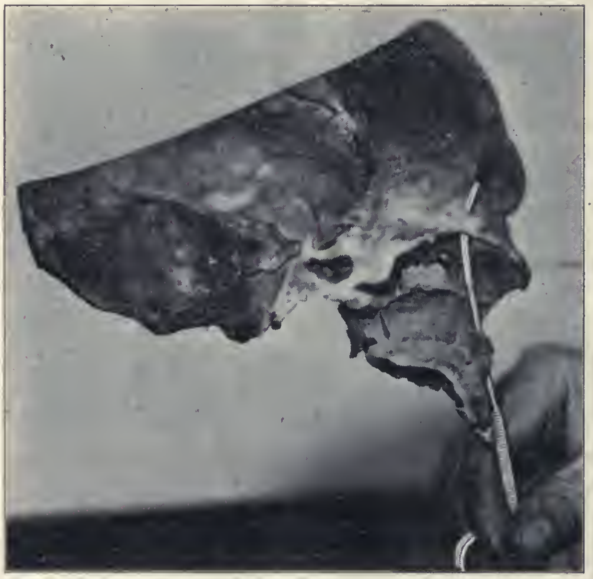


Fig. 5.—Frontal sinus rasp in position.

Case III: Miss M., twenty-nine years of age, was referred to me by Dr. Atkinson Sept. 27, '07. The patient complained of severe left-sided frontal headaches for the past year, especially in the morning, and gradually growing worse. She complained of an increased nasal discharge, which she thought was about the same in quantity from either side. Two months before the patient had an oedema on the left eyelid and excessive pain. The pain radiated to the occiput and was markedly increased on pressure over the left frontal sinus. The left pupil was dilated and reacted sluggishly, which the patient said had been the case since her trouble in July. On taking cold her headaches were more severe. The temperature was 99 1-2 at the time of the first examination. The left sinus on transillumination showed a shadow and the X-ray showed a greater density. There was no dropping of upper lid and no involvement of the extrinsic muscles of the eye.

On examination of the nasal cavity I found an enlarged middle turbinate on the left side and underneath it a small polyp. I could not detect any secretions under the middle turbinate at this time.

6

On operating I found at least ten polypi filling the various ethmoidal cells which I removed thoroughly at the same time I performed the frontal sinus operation. Four weeks after operation the pupil was almost normal in size and its reaction to light practically normal.

I had difficulty in this case to keep the sinus open and the canal filled up with granulation tissue, and I may insert one of my gold-plated wire tubes to keep the passage permanently open. The patient remained in the hospital one week and had a normal temperature every day, except the first, when it was up to 99 2-5. There was no oedema of the eyes. The patient is now free from pain.

Case IV. Miss R, River Forest, Ill., thirty-six years of age, American, came to my office Jan. 1, '08.

Three years ago the patient had an acute Rhinitis, which was followed a few days later by severe pain and headache over her left eye. In five days these pains subsided but there was an increased discharge from the left nostril and for six months the patient says she had a bronchitis, which I think was due to the pus causing a continued irritation in the pharynx. She has had a constant discharge during these three years, and occasionally a dull pain and headache over the left eye.

On Dec. 31, '07, she developed an acute frontal sinusitis with the following symptoms:

One week previous the patient was again taken with an acute coryza and the nasal passages were obstructed considerably. She complained of severe pain over the left sinus, which radiated to the occiput. She also complained of deep seated pain back of the left eye. There was marked tenderness on pressure over the left sinus. When blowing her nose the pain was felt mostly in the occiput, while coughing or sneezing increased the pain in the sinus. There was a slight drooping of the left upper lid, which varied according to the severity of the pain. The muscles of the eyes were normal and the pupil was not dilated.

On examination of the left nose the middle meatus was filled with a creamy yellow pus, which when washed out could be seen coming from underneath the middle turbinate. The latter was considerably enlarged and from below it there projected a polyp which seemed to grow from the infundibulum.

The nose was sprayed with adrenalin and cocain and the patient was asked to spray the nose three times a day with adrenalin chloride. The first treatment gave relief for eight hours and subsequent treatments failed. Freer's transillumination lamp showed a shadow over the left sinus and the X-ray plate was a little darker over the left sinus than the right.

On Jan. 3, '08, I removed the middle turbinate, polyp and the anterior ethmoidal cells and passed a heavy probe into the sinus. This operation did not give relief whatever and on Jan. 10, I performed my sinus operation. She slept well the same night and has not had any pain since. She remained in the hospital four days. Her record shows a temperature of 99 on the second day and normal the two following. There was no oedema of the eyelids following the operation.

72 Madison Street.

A PLEA FOR CONSERVATISM IN THE TREATMENT OF CHRONIC EMPYEMA OF THE MAXILLARY SINUS.*

BY T. W. MOORE, M. D., HUNTINGTON, W. VA.

There has been so much said and written upon chronic empyema of the maxillary sinus during the past year that it seems like "carrying coals to Newcastle" to try to add anything. Nearly all the recent literature to which I have had access has, with noticeable unanimity agreed upon the intranasal opening and treatment of this disease, and has decried the so-called Caldwell-Luc operation (which is usually accepted as the radical one) save in exceptional cases. To all of this I am in accord, but each writer has, it seems to me, vied with his confrère in destroying as much as possible of the nasal wall of this cavity, and it is remarkable the ingenuity displayed in devising new chisels, saws, drills, etc., for this purpose, each possessing some special advantage in the hands of its inventor, according to his special methods and skill.

Historically, it is interesting to trace the various ways and means of treating this malady since Nathaniel Highmore in 1651 described the sinus. Following William Cowper with his operation that still bears his name, (although he probably was not the first to open the antrum through the socket of a tooth), came Gooch and John Hunter, who independently proposed an opening through the nasal cavity, and a Swedish surgeon with an unpronounceable name who operated after the manner of Cowper, and then made a counter opening into the nose through which he passed a second canula, and so on down to the paper of Ziem in 1886, whose essay was the first to describe the frequent occurrence of this affection without the classical symptoms of pain, swelling and tenderness, and which was the beginning of our present methods. This is so striking when compared with the writings of to-day that Jonathan Wright, from whose book my historical references are mostly taken, says "I am sure any one, reading these accounts of operations on the Antrum of Highmore for suppurative disease, will perceive that all the recent procedures, which have been of late so exhaustively and frequently described, have been long anticipated in surgery."

Our critics have said "we move in a circle," to which our friends reply "that it is a spiral, and each revolution finds us on a higher plane."

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* Read before the Twelftn Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., September 26, 27 and 28, 1907.

I am not here to-day with any new methods or appliances, but to cite a few cases treated by opening the antrum through the inferior meatus after the manner proposed by Krause in 1889, and washing the cavity daily with normal salt solution. These canulae are from four to five millimeters in diameter, permitting a large volume of solution to enter, and sufficient pressure to cleanse the cavity, being one of the numerous advantages over treatment through the natural opening or the use of a small canula. That this method is not applicable to cases where polypi or other tumors exist is self evident, but that a number of cases are cured without the unnecessary destruction of the nasal wall, and leaving a permanent unprotected opening into the antrum is, I think, proven. It is too early to claim that this entrance into the cavity never does harm, certainly it does no good.

My technique is to make the puncture under the inferior turbinate, as close to it as possible, from 1.5 to 2 c. m. posterior to its anterior attachment, then washing the cavity thoroughly with the bulb of a Holmes' or Vail's nasal douche attached to the canula, using as stated above, the normal salt solution. I find the bulb much better than a syringe, as the pressure can be controlled and sufficient force exerted to remove all inspissated pus or other debris equally as thoroughly, and with much less damage to the mucous membrane than can be done with a curette; at the same time the natural opening is cleansed of scabs or dried secretion from this vis a tergo, which if Halle is correct, permits the cavity to be cleansed by suction from the inspired air. These washings are continued daily until the solution is free from pus, then every other day for two or three times, and then after one week, and if there is no pus the patient is dismissed as cured. This must be modified to suit the requirements of each case.

Case 1: This patient came to me November 19th, 1905, with a history of having had pus in the right frontal sinus, for which he had been treated for six months through the nose without benefit. Pus flows from right nostril all the time, and reappears in the region of the hiatus semilunaris when wiped away. A probe readily entered the frontal sinus.

The Krause trocar, with canula, was easily introduced through the inferior meatus, the withdrawal of the trocar being followed by some foul smelling pus. The cavity was thoroughly washed until the salt solution came away clear, again the next day this procedure was repeated, there being a large amount of pus, this was continued every other day for ten days, when, to my surprise, the washings were clear and free from pus. I was informed a few months ago that patient had not had any further trouble and regarded himself as permanently cured.

Case 2: Mrs. B., aged 53 years, came to me August 23rd, 1905, with loss of sense of smell and a constant purulent discharge from the right nostril, which patient stated had continued since an attack of septicaemia fifteen years ago. Both middle turbinates were large and pressing against the septum, right nostril being much smaller than the left. I removed the middle turbinates. On November 18th I removed the right inferior turbinate preliminary to doing a radical operation on the maxillary antrum. One month later the patient, who had been a semi-invalid for years, begged me to try some expedient that would relieve her and not tax her strength like an operation under a general anaesthetic. I made an opening in the nasal wall with the Krause trocar and canula, and washed the cavity which was filled with thick pus, thoroughly. This washing was kept up daily for a long time; then every other day, and finally once a week until May, when I discharged the patient as cured. To-day she remains free from the constant dull headache, her general health is much improved and the secretion in her nostrils normal.

Case 3: Female, aged 35 years, came complaining with headache and a constant dripping in the throat, and a disagreeable odor that nothing seemed to remove. Found both middle turbinates enlarged and pressing against septum, some pus in left nostril in region of middle turbinate. Removed anterior ends of both middle turbinates January 14th, 1907—on April 12th opened left maxillary antrum with the Krause trocar and canula enlarging opening slightly with Myles' back cutting chisel, finding considerable pus of foul odor,—continued washing cavity until April 2fith, when washings were free from pus and patient was dismissed as cured. This patient thinks that this trouble began three years before, with an abscess at root of first molar tooth.

Case 4: Mrs. D., aged 50 years, came to me in April of this year with a history of antrum trouble first diagnosed by her dentist several years ago—was complaining of being annoyed by a constant foul odor, worse after stooping. Had just been examined by her dentist and family physician, who sent her to me for treatment of antrum disease. I found the nostril clean, and practically normal, transillumination showed the face very clear, but left pupil could not be seen. I was much inclined to doubt the correctness of this diagnosis, but decided to make an opening through the inferior meatus, which I did with Myles' chisel, and found foul smelling pus. This cavity was washed daily at first, and then less frequently until the middle of May, when patient was discharged, the washings from cavity being free from pus. Patient returned in August, stating that her dentist claimed there was pus which he had been able to reach through a cavity in the third molar tooth, stating that he was able to introduce a probe through the tooth into the antrum. This, I was unable to do, and as the pupil was perfectly illumined by the usual method, and she had none of her old symptoms, I sent her back to have the decayed tooth extracted, assuring her that would end her trouble. Patient did this and has had no further trouble.

Case 5: This patient has had a purulent rhinitis with headache for many years, the septum has a very large perforation, no illumination of pupil or region of maxillary antrum, has more pain and pus in left nostril. Opening through inferior meatus showed much pus in antrum not fetid, patient lives seventy miles away, and has not been treated with any regularity, but is much improved and free from her distressing symptoms of heaviness and pain. No bacteriological examination was made of discharge.

Case 6: This patient has been a chronic sufferer from neuralgia for years, came to the office with an acute exacerbation much worse as are all of her attacks, on the left side. Examination revealed pus in left nostril which flowed freely after cocainizing the middle turbinate and gave relief from pain. Made an opening through the inferior meatus with Myles' chisel, finding pus,—thoroughly washed cavity and patient had a restful night, free from pain. In two weeks patient went to the country having had no pain since first treated, and at the time of departure no pus in the cavity as demonstrated by douching it.

Case 7: Male, aged 38 years, does not know when empyema of maxillary antrum developed or the cause. The cavity was opened through the socket of the second bicuspid tooth by my predecessor who gave up practice over ten years ago. At present there is a disagreeable odor of which the patient is conscious all the time, and his associates frequently. There is a fistula at site of old opening which he keeps patulous with a tooth-pick or anything convenient; after dilating this canal he is able to force fluid from his mouth into the antrum and has been cleansing it in this manner for years. Opening and washing through inferior meatus brought pus in abundance and fetid odor. Since the first washing the odor has subsided, and very little pus, after three weeks' treatment patient was dismissed.

I think that from these few cases, selected for the reason that they were unquestionably chronic, we are justified in trying this simple procedure at least for a few weeks before destroying the naso-antral wall, that we are safe in concluding that the mucous membrane only needs thorough cleansing in a large number of cases to render it free from disease, and that washing it thoroughly can accomplish this as effectually and with much less destruction than the currette.

Nasal Headache and Neurasthenia. ARTHUR HARTMAN. *Deutsche med. Wchnsch.* May 2, 1907.

After a review of the various causes of headaches of nasal origin, the author calls attention to the fact that characteristic frontal sinus pains may be produced by swelling of the mucous membrane of the infundibulum and absorption of air in the sinus, without actual infection of the sinus itself. Such cases get well rapidly upon appropriate nasal treatment.

YANKAUER.

Paraffin Protheses. K. J. WEDERHAKE. *Deutsche med. Wchnsch.* Oct. 3, 1907.

The author believes that in two of his cases slight emboli formed after the injection of solid cold paraffin. He believes that this may be avoided by the use of a special mixture of paraffin and rubber, which is less brittle than the solid paraffin itself.

YANKAUER.

DILATED VEINLETS UPON THE EXTERNAL NOSE AND SEPTUM; THEIR PERMANENT CLOSURE WITH THE POSITIVE GALVANIC NEEDLE.*

BY OTTO T. FREER, M.D., CHICAGO.

The electrolytic destruction of dilated and tortuous veinlets upon the external nose, because of the blemish they create, and of thin-walled little veins upon the anterior part of the septum, because of the repeated nose-bleed they give rise to, has proven a useful procedure to me, and one which has seemed worthy of a more detailed description than my brief mention of it in a previous article in 1906.[1] Some years ago I gave up the attempt to obliterate disfiguring veins in the skin of the external nose because, misled by the method in common use among dermatologists, I used a needle connected to the strongly caustic negative pole. In spite of the more destructive effect of this pole, as compared to the positive one, it failed to permanently close the veinlets needled, because the clot formed in the vessel at the negative or alkaline pole is soft and friable, so that it dissolves away in a few days with a restoration of the circulation in the vessel. In addition, the needle, when connected to the negative pole, with even so slight a current as one or two milliamperes, created little sloughs in the skin that led to the formation of disfiguring dry scabs, which took some weeks to separate, and left red spots for some time.

The firm clot produced at the positive pole of the galvanic current in the electrolytic clotting of aortic aneurysm led me connect the needle to this pole in the treatment of ectatic veinlets upon the nose, and their obliteration has, so far, in the cases seen by me, been lasting, my first patient having been needled three years ago with no reopening of the vessels closed. When the needle is connected to the positive pole, no slough is produced where it enters the skin, as the positive pole is only slightly caustic, and does not destroy the cutis, even when the current strength employed is beyond what is required to close the vessel operated upon, so that five milliamperes may be used without bad effect, unless the electrical action be unduly prolonged. Instead of the deep adherent scabs that follow the use of the needle when it is negative, when positive, it at the most produces slightly attached minute ones, that drop off in a few days.

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*Read before the Chicago Laryngological and Otological Society, October 8, 1907.

[1] Chairman's address, Section on Laryngology, Boston meeting of the A. M. A., 1906.

The manner of operating is as follows: The current employed is the constant Galvanic one, derived either from a battery, or from a wall plate which reduces the street current. A rheostat and milliampere meter are necessary accessories. The needle used is exceedingly fine, and is of iridioplatinum, as one of steel would be quickly destroyed by the acids of the positive pole and would stain the skin black. This needle is clamped in a holder made for the purpose and in common use. The needle is connected to the positive cord of the battery or wall plate, while the negative cord is inserted in a large, flat sponge electrode placed in the patient's lap.

Where the patient is unduly sensitive to the sting of the needle when the current is turned on, he is directed to close the circuit gradually by placing his hand gently upon the sponge after the needle is inserted into the vessel. More courageous patients are told to keep the hand permanently upon the sponge, the introduction of the needle closing the circuit under these conditions. This method is more painful than the first, but permits very rapid work.

The current strength used is from two to five milliamperes, according to the fortitude of the individual treated. The weaker the current the longer is the time required to close the lumen of the vessel. The electrolytic action may be increased by pressing the hand more firmly against the sponge or diminished by making its contact lighter, the patient thus controlling the amount of electricity he is willing to endure, the hand acting as a rheostat under his guidance.

The needle point is inserted into the peripheral ends of the branches of the veinlet first, each being punctured at close intervals towards the vessel's trunk until this is reached, when it is also followed up along its whole length to its proximal end. The vessel is seen to blanch as soon as the needle is introduced and the current closed, while bubbles of gas may be observed to travel along its empty lumen. I have never known these gas bubbles to do harm, although they enter the circulation. If the needle be pulled out too soon, blood will flow, but if the current has acted long enough a white, tortuous line will be seen in the place of the veinlet attacked or in larger vessels a blackish, blue streak will mark the clot in it. Where a current of five milliamperes is used, about five seconds for each puncture will suffice to close even a larger veinlet of about knitting needle size, for the smaller vessels from one to two seconds are sufficient. The reason for puncturing the vein along its course, and for not being satisfied with merely closing its lumen at one point is the need of excluding a reopening of the vessel by collateral channels, and of being certain of the destruction of its tunica intima.

In some cases all of the dilated veins upon the external nose may be closed at the first sitting, the patient's appearance showing an immediate improvement which is very gratifying to him. No sloughs mark the site of the punctures, as where the needle is connected to the negative pole, their location being merely indicated by an exuding drop of serum. No external application is needed after the operation. The coarser the vessels the easier is it to obliterate all of them at the same time, for larger veins remain visible in spite of the blush of the skin produced by the irritation of the treatment. Finer ones soon become hidden by the reddening of the skin, and thus a second or third sitting may be required before all of them have been found and punctured. Diffuse spots of redness, caused by a network of very fine vessels, are especially hard to eradicate.

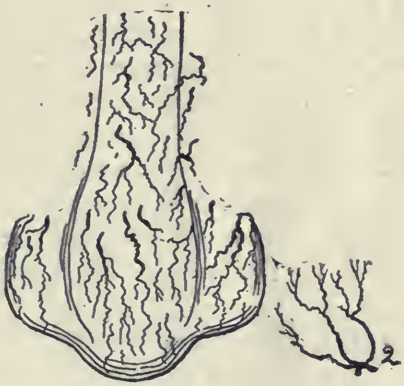
The work is very trying to the eyes, and is best done in daylight and with a pair of strong convex glasses.

I have not had the opportunity to try the effect of the positive needle upon the vascular protuberances of rhinophyma or acne rosacea, my experience being limited to dilated vessels coursing over noses not otherwise disfigured. It seems to me, however, that the multiple punctures of such outgrowths with the needle might lead to their absorption by destroying the venous plexus within them.

In addition to the relief of disfigurement by destroying ectatic vessels upon the external nose I have used positive electrolysis for the eradication of the little veins with friable walls which are situated upon the foremost part of the septum, and which are so readily torn open by the finger nail or handkerchief with resulting nose-bleed. Recurrent attacks of epistaxis produced in this manner may become a serious matter and give the patient a great deal of anxiety. In my experience spontaneous nose-bleed comes oftener from the vessels in this location upon the septum than from the other regions of the nose.

The usual method of destroying these veins is by means of the galvano-cautery. The objection to this procedure is the irritation and scabbing following it, until the destroyed epidermis has been replaced. The positive needle creates no slough in the mucous membrane, no irritation or scabbing follows its use while the vessel may be eradicated completely nevertheless.

I append sketches from life of two cases. One of them shows tortuous veins of the external nose and the other veinlets coursing down the anterior part of the septum to the nasal floor. In both of these cases complete and permanent closure of the vessels was produced.



Numerous dilated veins on external nose, all of which were caused to disappear by positive electrolysis in two sittings.

2. Dilated veinlets at front of bottom of septum. Obliterated by electrolysis.

The treatment, of course, does not prevent a later dilation of other vessels in a normal state at the time of the operation, and the patient should be warned of this. To avoid a reopening of the closed vessels, it is also necessary to be very thorough in the needling, and to use a current of sufficient strength to destroy the vessel wall about the needle.

34 Washington street.

SUBMUCOUS TURBINECTOMY.

BY H. V. WURDEMANN, M. D., MILWAUKEE.

The writer has not yet seen in the literature a description of the following described intra-nasal operation, which has been done by him several hundred times. Bearing in mind the fact that we have been doing submucous resection of the nasal septum for several years with good results, a like procedure applied to the hypertrophied turbinated bodies seems a reasonable proposition. On account of its simplicity and the probabilities that a similar procedure may have been done by others, although not yet, to the author's knowledge, described, it is submitted with some hesitancy to the profession.

First of all, I want it distinctly understood that I am adverse in nearly every case to a complete excision of the inferior turbinal bodies. I believe such procedure is unwarranted and leads to disastrous results later, in the loss of function necessitated by such a complete removal,—usually resulting in the production of atrophic rhinitis, or atrophic pharyngitis. Therefore, for several years I have not customarily removed any large portion of the turbinal, but have been satisfied with an excision of the hypertrophied lower edge of the bone, together with removal of a small amount of redundant mucous membrane. To this end I adapted the scheme of submucous resection of the septum to the turbinal.

My operations have nearly all been made in the office under local anesthesia, the nose being cleansed several times during the previous twenty-four hours by an alkaline wash with a nasal douche cup or atomizer. The patient is seated at the time of the operation, the mucous membrane being anesthetized by a small quantity of powdered cocain applied along the line of the proposed incision with a pledget of cotton on a probe, which has been previously dipped in adrenalin or suprarenalin 1:1000 solution; this with the powdered cocain makes a very strong solution of cocain,—approximately 50 per cent. The nose is douched with warm alkalin solution about ten minutes after its application, then the operation is begun. If there be any pain during the procedure the cocainization may be repeated.

The instruments necessary are a nasal speculum and a good source of illumination,—reflecting head mirror (or a small incandescent light may be inserted in the opposite nostril, (according to the suggestion given me by Dr. Lichtenberg of Kansas City several years ago.) Either procedure lights up the nose well and brings the operative field into view. A scalpel having a short blade and long shank with the handle bent at about 35 degrees is then put into the inferior meatus, its cutting edge being directed towards the turbinal body; an incision is made along the entire length of the turbinal, the cut being carried down to the bone; the upper flap of the mucous membrane is loosened from the bone with a Freer elevator and pushed up until its edge is well into the middle meatus, then the scalpel is inserted under the turbinal and a cut made down to the bone, the extent depending upon the amount of hypertrophied tissue desired to be removed.

The next step is to remove the bony edge, using by preference, a saw curved on the flat; where the bone is thin the scissors suffice,—I prefer the alligator-jawed form; then the section is cleared away and brought out by alligator-jawed forceps, any tags of tissue being cut off by scissors; then the upper flap is brought down by aid of the elevator and applied neatly to the raw surface, usually completely covering the wound. A Bernay's compressed cotton tampon, or more recently, a fold of P. D. Co.'s adrenalin gauze is gently placed between the flap and the septum, care being taken not to disturb the flap. This packing is removed on the next day, and the nose washed out by an alkaline solution, and a like cotton tampon placed in the nostril. On the next day the nose is again washed out and the patient given an antiseptic wash, cotton being worn in the nostril for about two days, and then the patient being allowed to breathe through it.

The case is usually discharged in three or four days. If any granulation tissue or poor healing occurs, I apply or rub down the granulation tissue with a cotton applicator dipped in Tr. Benzoin Comp. Where atresia has occurred between the turbinal body and septum, the surfaces are kept apart until they are healed, by thin plugs of dental wax;—but atresia has only resulted from this form of operation once in the series done by the author according to this method.

105 Grand avenue.

SOME INTERESTING TONGUE CASES.

BY RICHARD H. JOHNSTON, M. D., BALTIMORE.

The tongue is probably the most neglected organ in the body from a diagnostic standpoint. This is not difficult to understand when we realize that diseases of the tongue are referred to in the most casual way in most medical schools and no attempt is made to differentiate between diseased conditions. Thus, if a patient presents himself with an ulceration, no particular pains are taken to study the character of the lesion but potassium iodide is prescribed and he is instructed to return at some future time when the decision for or against syphilis is made.

Without correct diagnosis, it will be impossible to give the proper treatment, consequently a lesion, perfectly harmless in the beginning may become much more serious later on. The laryngologist through force of circumstances must know something about diseases of the tongue. He will be consulted from time to time by patients who complain only of some disturbance connected with this organ, which certainly comes within his province as a throat specialist. Until a few years ago I had given almost no attention to this important subject. But the ever increasing number of such cases in hospital practice convinced me that diseases of the tongue are of sufficient seriousness and importance to require careful attention. Even in those cases not dangerous to life, the discomfort and sometimes sufferings of the patient demand our earnest consideration. Unfortunately books and literature are scarce on the subject.

It devolves therefore on the laryngologist who, perhaps, sees more tongues than those in other branches of medicine to work out his own methods of diagnosis and treatment. The man who makes a special study of tongues sees very interesting and curious conditions, and in looking up the scanty literature on the subject, he realizes that the opportunities for working out better methods of diagnosis and treatment are just as great as in other branches of medicine. In the examination of a large number of mouths and throats, it has been my good fortune to see some rare diseases of the tongue; I believe they are of sufficient interest to place on record. Some of them have been reported from time to time, but this is the first opportunity I have had to give them out in group form.

CASE I. *Black, hairy tongue. Nigrities. Hyperkeratosis Linguae.* In November, 1901, E. C., 56 years old, in good health, appeared in the throat department of the Presbyterian Hospital. He stated that he had always enjoyed good health and that he had not come to the hospital on acount of illness, but because of a peculiar sticking sensation in the mouth and of a blackness of the tongue. The duration of his trouble was two months. Protrusion of the tongue showed a black discoloration, almost round, measuring about an inch in each diameter. The patch was situated in front of the circumvallate papillae in the center of the dorsum. After careful drying with cotton, a more satisfactory view was obtained. The black area was covered with what were apparently hairs from half to three-quarters of an inch long. The mass of hairs could be moved about with the probe. Under the microscope each filament seemed to be made up of epithelial scales, one on top of the other, and brownish granules, to which the color was probably due. I think it has been definitely decided that this trouble is caused by a prolongation of the filiform papillae and the thickening of the epithelium. The cause of the color is a disputed point. Bresin believes that the color is produced by a yeast-like organism. Ciaglinski, Hewelke and Sendsiak succeeded in cultivating a fungus, which they asserted caused the color. Their results have not been confirmed by other investigators. Mourek found on the prolongations of horny epithelium which lengthen the filiform papillae a peculiar coloration due to their horny nature. He could not find fungi. Goodale found the color to be due to highly refractile, yellowish brown granules varying in size up to that of a red blood corpuscle. Black tongue is rare; a few years ago I could find only thirty-three cases in the literature. Symptoms are usually so slight that the discoloration is discovered only by accident. Treatment is not necessary in the majority of cases.

CASE II. *Varicose veins of the tongue.* A female patient, 64 years old, consulted me for throat trouble of many years' standing. She did not complain of her tongue and did not know that it presented anything unusual. When she opened her mouth for the examination of the throat, the peculiar appearance of the tongue was noted at once. On both borders of the organ and extending to within half an inch of the tip were bluish, tortuous, rounded vessels, measuring about four or six millimetres in diameter and covered with mucous membrane. They were soft and compressible and reminded one of varicose veins of the leg except that they were more distinct. The color was almost as dark as indigo. The vessels terminated abruptly near the tip of the tongue. On the dorsum just internal to the anterior faucial pillars were two isolated vessels entirely separate from each other with the same bluish color. They apparently had no connection with the vessels on the borders. The ranine veins were unusually large and tortuous. At the base the vessels were not especially prominent.

The patient had not noticed the condition and could give no information that threw any light on the abnormality. She had had no hemorrhages. From the isolation of the vessels and the fact that they had caused no trouble, I am inclined to believe that the condition was congenital. The case is of no practical importance, but is certainly a medical curiosity.

CASE III. *Excoriation of the tongue.* In a lady, 35 years old, a simple excoriation on the right border of the tongue had given a great deal of trouble. She said the lesion had arisen seven years ago from irritation caused by a rough, bicuspid tooth. A dentist had smoothed down the tooth, but she had never entirely recovered, When she ate highly seasoned foods, pain was very severe. At times there would be a decided improvement in the condition of the tongue, but she was always conscious that she had such an organ. During the past few months the general discomfort had grown much worse, so that she was never free from suffering. Examination of the tongue showed a half inch space entirely denuded of epithelium. The bicuspid tooth was somewhat rough and was constantly irritating the sore surface. For a month before I saw her, she had been using a stick of nitrate of silver on the excoriation by the direction of a physician, and it had grown steadily worse until she could no longer stand the pain caused by the caustic. The patient was instructed to take a bland, non-irritating diet and was particularly cautioned against highly seasoned foods and alcoholic beverages. The raw surface was painted very gently with a solution of chromic acid, ten grains to the ounce of water and a mild chlorate of potash mouth wash given. Under this treatment she improved steadily; the excoriation decreased in size and pain practically disappeared. When recovery seemed sure, she went to New York and indulged too freely in the pleasures of the table with the result that the old trouble returned. She was again cautioned as to diet and given borax and honey to use at home. A short time ago I heard that as long as she is careful about her diet, she is practically well. The lesson to be learned from this case is that the use of strong caustics is contra-indicated in nearly all diseases of the tongue. The well-known tendency of diseased areas on the tongue to become cancerous must always be considered in outlininng treatment. This tendency is greatly increased by the indiscriminate use of nitrate of silver. If a simple excoriation does not yield to persistent treatment, it had better be carefully watched and removed if the slightest induration appears.

CASE IV. *Erythema Migrans or Wandering Rash.* Typical cases of this affection are rarely seen. This may be due to the fact that subjective symptoms are slight or not present and the disease is observed by accident. In a case seen by me a few weeks ago, the appearance of the tongue was characteristic. On the dorsum were red areas devoid of filiform papillae and surrounded by irregular, wavy, whitish or yellowish-white lines, which bore some resemblance to the lines on a map, so that the name "geographical tongue" could well be given the condition. The red areas were not sensitive and the patient, a boy 8 years old, complained of no symptoms. He was pale and anaemic, which symptoms were caused by hypertrophied tonsils and adenoids. The cause of the condition is not certainly known. It is essentially a disease of childhood, though it is occasionally seen in adults. The old theory that it was due to syphilis has about been discarded. Most children who have the disease are debilitated and scrofulous. Parrot had an opportunity to examine such a tongue microscopically and found the epithelium at the bottom of the patch swollen and thickened; the cells of the horny layer were increased in size; the cells of the Malpighian layer were also increased and proliferated. In the papillae and neighboring parts of the derma around the vessels were a large number of lymphoid cells. He regarded the derma as the essential seat of the disease. It may be considered as a subacute papillitis or inflammation of the derma of the mucous membrane. The disease is in most cases incurable and since symptoms are so slight, no active treatment is required.

CASE V. *Fibroma of the Tongue.* A colored woman, 42 years old, presented an oblong tumor at the tip of the tongue about half an inch from the middle line. The growth was probably half an inch long and caused little annoyance. To the touch it was fairly hard. Tho color was grayish and few vessels were seen. A probable diagnosis of fibroma was made and removal advised. The patient refused operation so the diagnosis could not be confirmed by the microscope.

CASE VI. *Dermoid Cyst under the Tongue.* The patient was a colored girl, 22 years old, who had noticed some months before, a swelling under the chin which had increased rapidly in size until breathing and talking were somewhat interfered with. The neck appeared very much enlarged and the floor of the mouth bulged upwards so that the tongue did not move normally. To the touch the swelling was soft and imparted a doughy sensation to the finger. A diagnosis of cyst was made and removal advised. The patient would not consent to an external operation so under ether anaesthesia a long incision was made in the floor of the mouth. No hope was entertained of removing the cyst wall through the mouth, but the operation was performed to puncture the growth and draw off its contents as a means of temporary relief. The wall of the cyst soon came into view, and, after exposing it for some distance with a dull dissector, a small puncture was made to ascertain the contents. A thick, pultaceous semi-fluid appeared. The opening was then enlarged and pressure exerted from below. The cyst rapidly emptied itself and the walls collapsed. An effort to separate the walls from the surrounding tissue succeeded and in a few minutes we had the satisfaction of removing the entire cyst wall through the wound. The cavity was packed with iodoform gauze, a few sutures introduced and the patient put to bed. Recovery was uninterrupted and there has been no recurrence of the growth. The cyst corresponded to those congenital cysts which are occasionally found beneath the tongue, remain small for years and suddenly take on rapid growth from some unknown cause. The pultaceous contents of the cyst was sebaceous in character. At the time of removal the growth was probably as large as the fist. The diagnosis of dermoid cyst is made by its location under the tongue, its yellow color when it bulges into the mouth and the pitting on pressure.

CASE *VII. Gummatous Ulcer of the Tongue.* A man 47 years old, for some weeks, had pain on swallowing which had gradually grown worse. When he came to the hospital, he could swallow only the softest food. On the dorsum of the tongue just in front of the circumvallate papillæ was a large, red swelling, evidently the cause of his pain, in the center of which was a mass of necrotic tissue which, on removal revealed a large, deep, crater-like ulcer. The patient gave the history of a chancre twenty years before, but denied having had the usual secondary symptoms. The red color of the swelling was peculiarly livid. The swelling was hard to the touch, and extended several millimetres above the normal surface of the tongue. The diagnosis of gumma of the tongue is sometimes difficult to make. The ulcers of tuberculosis and cancer may be taken for syphilis and *vice versa.* A swollen mass far back on the dorsum of the tongue is usually gummatous in character. The other diseases occur very rarely in this location. The results of treatment are not so satisfactory in the tertiary as in the secondary stage of the disease. The best results are gotten from tonics and specific treatment.

The patient returned to the hospital a few days later. Over the area covered by the gumma, were three distinct ulcers, two of which had broken down since his first visit, and both had the appearance of the first one. The patient between the first and last visits had been upon active syphilitic treatment. The fact that there was decided progress in the ulcerative process shows how malignant gumma of the tongue sometimes is.

ADDENDA.

Since finishing the above article, I have seen another case of hairy tongue. A patient, 43 years old, came to the University Hospital complaining of throat trouble. During the examination a black discoloration was seen about the center of the dorsum of the tongue. On careful inspection the filiform papillæ were found elongated, and not a few of them were dark brown in color. The colored ones varied in length from one-quarter to one-half inch, and could be smoothed out on the tongue with the probe. They resembled hairs, and gave the typical picture of nigrities. The hairy growth was not so pronounced as in Case 1. The patient did not complain of his tongue, and knew nothing of the peculiar formation.

Another peculiar and rare condition of the tongue was seen on November 13, 1907. A male patient, 50 years of age, had been ill since November 10. His illness began with rigors and fever, pains in the head and back. At the same time he experienced slight pain in the tongue, which rapidly increased to such an extent that in twelve hours the organ was so swollen and painful that he had great difficulty in swallowing. When he came to the hospital, he could scarcely open his mouth. On account of his suffering when swallowing, he had eaten practically nothing for two days. Examination of the tongue showed an acute inflammation of the anterior two-thirds of the left half of the organ. The part was red, swollen and tender to the touch. At about the center of the swelling there was the sensation of a nodular mass, rather hard to the finger. The slightest movement caused great pain. The tongue could not be protruded from the mouth. The right half of the organ was normal in appearance. An incision into the swelling was made and free bleeding followed. The patient at once experienced some relief. He was given a purge and warm Dobell's solution as a mouth wash. Two days later he returned practically well. Acute parenonymatous hemiglossitis is rarely seen. Statistics from large hospitals show that it is not as common as acute glossitis, in which the whole tongue is more or less involved. Unlike the latter disease, it usually runs a benign course and the patient would recover without treatment. For the relief of pain which is severe, incision followed by free bleeding is the best procedure. The disease occurs oftenest in males, and on the left half of the tongue. The most common cause seems to be exposure to cold. The organisms gain entrance through an abrasion of the mucous membrane from a bad tooth or some slight trauma.

919 North Charles street.

Alypin in Otology. BURKNER. *Berl. klin. Wchnsch.*

The author has found a 5 per cent solution of alypin a useful local anesthetic in operations upon the middle ear. It is less poisonous than cocaine, and its solution can be boiled. Unless combined with adrenalin it does not contract the tissues.

YANKAUER.

The Meningococcus and the Micrococcus Catarrhalis in the Naso-Pharynx. JEHLE. *Wiener klin, Wchnsch.*

Both these germs may be found in the mucus of the nasopharynx, but are seldom found in the anterior parts of the nose. They may be destroyed by the use of Pyocyanose.

YANKAUER.

ACCESSORY THYROID AT BASE OF TONGUE.*

BY CHAS. E. PERKINS, M. D., NEW YORK.

The following case came under my care on August 7th, 1907.

A. McG., female, aged 12 years. Had been well until two years previously when she had diphtheria which was followed one and one-half years later by measles complicated with pneumonia.

Present trouble began soon after the diphtheria, the main symptom being a peculiar thickness of speech. One year later her physician removed her adenoids for this condition but without relief.

On examination an enlargement, size of hens egg, could be seen at back of tongue. It was of bluish red color, elastic to the touch, freely movable and with a deep sulcus between it and base of tongue. The epiglottis had been pushed back by it and could not be seen with the mirror, nor could it be felt. The tumor extended completely across the throat from side to side and above to the soft palate. Still deglutition and respiration were well performed.

Operation was performed on the following day with kind assistance of Dr. Frank T. Hopkins. The patient was etherized.

On account of the vascularity of the tissues forming the capsule it seemed best to tear through these. Therefore fixing the tumor by hooking my index finger around it, I plunged a Knight's Nasal Forceps through the capsule, then by separating the blades an L shaped rent was made through which the finger was introduced and the tumor enucleated. Hemorrhage was quite free but not alarming, and the patient made an uneventful recovery.

There is still (Oct. 22) a small enlargement on the left side, about the size of a small hickory nut, but her voice is very much improved. She has gained in flesh and looks much healthier, and in view of the fact that recent operators have intentionally left a piece of the accessory thyroid behind to prevent myxoedema, I propose to watch the case and await developments.

I am indebted to Dr. George Sloane Dixon, Pathologist to the New York Eye and Ear Infirmary, for the following report:

"My Dear Dr. Perkins:—

"I beg leave to report that the tumor from the base of the epiglottis submitted some time ago measured 23.5 x 26 mm., that it apparently had a connective tissue capsule. When divided, gross examination of the cut surface showed a thin stroma running through it forming the walls of relatively large spaces filled with a gelatinous, translucent looking material."

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* Read before the Gouveneur Hospital Alumni Society, Nov. 12th, 1907.

"Stained sections showed the stroma to be composed of a thin layer of white and yellow elastic connective tissue fibres, and where the section was exactly at right angle to this layer, wall or septum, there was a single layer of cuboidal epithelium on each side, but when cut obliquely the epithelium appeared to be in several layers, and more uneven in form, naturally."

"The general appearance suggested adeno-cystoma at first, but more careful examination showed a distinct resemblance to thyroid tissue, the large irregular spaces being follicles distended with colloid material generally free from granules and cells."

"All signs of active inflammation were absent, as well as evidence of malignancy, at least at present."

"The capsule was very thin."

"A supernumerary, or accessory thyroid gland was undoubtedly present at the base of the epiglottis when the patient had her attack of diphtheria, and a sufficient amount of irritation resulted to give rise to the condition presented, which is similar to colloid goitre, or struma-gelatinosum."

"I am of the opinion that the remaining nodule is of the same nature and that its decrease in size is due to the better general condition of the patient, the removal of the irritation, whatever it was, and the partial absorption of the colloid material distending its follicles."

(Signed) "GEO. S. DIXON."

These tumors at the base of the tongue are derived from the middle lobe of the thyroid, which is formed by a process or bud from the pharyngeal epithelium in early foetal life. This develops between the sulcus arcuatus which afterwards becomes the epiglottis and the tuberculum impar, which form a part at least of the tongue. As the neck elongates in foetal growth and development, this process sinks below these structures, being connected with the tongue by the thyreo-glossal duct which ends at the foramen caecum. It is easy to see how a mass of thyroid tissue might remain at any location throughout the length of this tract or the tissue originally intended to form the middle lobe of the thyroid might be found "en masse" at the base of the tongue, having failed to descend to its normal position. In some of these cases the lateral lobes have failed to develop and this so called "Accessory thyroid" appears to have been the only one present as evidenced by myxoedema following its total removal.

I have made a careful search through the literature of this subject and have been able to collect forty-six cases, including my own. Of these, forty were females, five males, and in one case sex not stated; showing a very great preponderance for the female sex. The reason for this has not been explained.

The ages of the patients vary from birth to seventy-seven years, the majority, however, occurring during the second and third decades of life.

In thirty-three cases, operation for removal of the tumor was performed with good results, the patients having been cured or greatly improved. We must note an exception in four of the cases in which myxoedema followed as a result of the operation—cases of Reintjes, Goris, Benjamin and Seldowitch. Case of Chamisso should be excluded as myxoedema was present before operation.

In twenty-one cases, the operation was through the mouth by various means, snare, ligature, enucleation, curette, etc. In several cases, the anterior pillar was incised to allow the tongue to be drawn further out of the mouth. In seven of these twenty-one cases a preliminary tracheotomy is mentioned as having been done.

In twelve cases the route was through the skin between the hyoid bone and the chin with preliminary tracheotomy mentioned as part of the operation in three cases.

In the five cases of death, the tumor was the direct cause of death in one, at least (the case of Hickman), by pressing upon the epiglottis, causing asphyxiation in a new born child. In a second case (Meixner), a child that had never breathed was found, upon examination, to have had a large growth at base of tongue pressing upon the epiglottis. In a third case (case of Aschoff), a child died of myxoedema, at six months, without operation having been performed. In the other two fatal cases tumor was found at autopsy, patient dying of intercurrent affections.

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REPORT OF A CASE OF TUBERCULOSIS OF THE TONSIL, WITH REMARKS ON THE ADMINISTRATION OF POTASSIUM IODIDE IN TUBERCULOSIS.*

BY NORTON L. WILSON, M. D., ELIZABETH, N. J.

Mr. L. H., age 46, a German, height five feet eight inches, weight 140 pounds, was an employee in the Singer Factory as a fitter of shafting. He was referred to me for diagnosis on the fifth day of April, 1906. For the year previous, he had had symptoms of tuberculosis of the lungs; and about three months before he came to me, he had what his doctor thought was an attack of tuberculosis of the bladder. At the time I first saw him, both of these conditions were improved, but he complained of severe pain when swallowing.

He had never had hemorrhages, and at the time of his call his temperature was 98 degrees. He felt chilly at times, and occasionally had sweats. There was no huskiness of voice, but he complained of pain in the throat, especially during deglutition. He had a slight cough, which was more pronounced in the morning.

Examination of the throat revealed the fact that the left tonsil was red and jagged and covered with a whitish yellow film, which, when removed, showed broken down tissue with superficial ulceration involving the crypts in the lower portion, while the upper portion of the tonsil showed well marked yellowish points, surrounding the crypts. An arc of red and yellowish white points, somewhat resembling mycosis, spread over the soft palate. The mucous membrane in the mouth and pharynx was pale as was also the larynx. No involvement of the larynx was detected. The maxillary gland on the left side was slightly enlarged. Examination of the chest showed a small cavity in the upper part of the left lung. The pathologist reported tubercle bacilli in the sputum and in scrapings taken from the tonsil.

My diagnosis was secondary tuberculosis of the tonsil involving the soft palate, and to me it seemed a clear case.

Not long after his consultation with me, he consulted another physician who diagnosed the case as one of syphilis, and in this he was confirmed by another doctor. The patient was put upon twenty grains of Potassium iodide three times a day. Immediately the lungs began to break down, the throat symptoms became rapidly worse, and he died in agony early in July. I do not mean to say that this patient would not have died, but I do believe that his comfort was neglected and his death hastened by the course of treatment pursued. This I have observed in several similar cases, and I therefore plead in behalf of the tuberculous patient, that he should be spared the damaging effects of Potassium iodide.

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*Read before the Eastern Section of the American Laryngological, Rhinological and Otological Society, Boston, January 4, 1908.

Tuberculosis of the upper air passages is of interest to the members of this society, not alone because we see more of it than the other members of the profession, but because we too are apt to fall into errors in making a clinical diagnosis. More than once have I seen the disease diagnosed as tuberculosis and the patient make a rapid recovery after the liberal use of Potassium iodide. On the other hand I have seen cases of tuberculosis diagnosed as syphilis and Potassium iodide administered with most disastrous results.

Tuberculous patients do not tolerate iodides. It therefore behooves us to use extreme care in making the diagnosis, before we conclude to put them upon Potassium iodide.

It is not often that tuberculosis of the tonsil is mistaken for malignant disease, but not infrequently it is mistaken for syphilis. We can not always rely upon the laboratory diagnosis. All of us have, without doubt, had eminent pathologists give us a report of tuberculosis, when tubercle bacilli were not found, but giant cells were present, and yet the patient recovered upon mixed treatment.

How then shall we know tuberculosis when we see it? First of all we should get as complete a history as possible. If there is given to us a history of syphilis, we naturally conclude that a patient's present condition is syphilitic; but, even under these circumstances, it is not safe for us to exclude tuberculosis for the two diseases may co-exist. If we are told the patient is living with a tuberculous individual, has a cough, fever, sweats and consolidation in the lung, it is safe for us to conclude that the trouble in the upper air passages is of a tubercular nature.

While I believe in primary infection of the upper air passages, I am convinced that many of the so-called primary infections, are secondary in fact, and that a lung lesion, which really exists, has not been discovered. The typical symptoms are, however, frequently wanting, and we often have a hyperplasia of the tissues in the larynx or tonsil which is not always easy to diagnose.

After taking a complete history, it is my habit to look for tubercular lesions elsewhere, and not always to trust to my own judgment in such matters, but to have the lungs examined by an expert, and a tuberculin test given if necessary.

It goes without saying, that the sputum is always examined, and, if an ulcer is present, scrapings should be taken from this broken down tissue and submitted to the pathologist.

The local signs and symptoms should then be studied carefully, and here let me say that while enlarged glands in the neck and at the angle of the jaw are regarded, in some of the text books, as of extreme diagnostic value in syphilis, these enlargements may occur in acute primary tuberculosis or any other acute infection of the tonsil, mouth or nose. Fetor of the breath is also pointed out by some authors as being diagnostic of tuberculosis, but this is largely due to necrosis. The same odor may be found in any broken down tissue. A familiar illustration is to be found in the odor accompanying diphtheria. The character of the ulceration and the location of the hyperplasia are only helpful but not diagnostic.

In my opinion, the most important sign is palor of the mucous membrane and the most important symptoms are cough and pain. The cough may be due either to the pulmonary affection, the condition of the pharynx or the irritability of the larynx. The palor is the result of anaemia, and may be seen in anaemic individuals, but I have observed it more often than any other objective symptom. The pain is often complained of before ulcerations are present and is due to the infiltration of the tissues.

Iodid of Potassium[1] and Sodium are very diffusible and are rapidly excreted; setting free nascent oxygen and iodine at the points of elimination. They are remotely irritant to the mucous membrane. They induce great waste and rapid elimination of waste products, causing anaemia, emaciation and depression. Mercury salts in small doses are blood tonics, improving the general condition, increasing the number of red corpuscles and body weight. They soon, however, begin to promote waste by stimulating the lymphatic system.

A. Baurowicz[2] says, in doubtful cases of syphilis, if the iodide is not efficient, a mercurial treatment should be used in conjunction. The therapeutic test is the most reliable of diagnosis in many cases and should not be omitted before deciding upon the malignant nature of a suspicious growth.

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(1) Potter's Materia Medica, Pharmacy and Therapeutics, page 354.
(2) Vol. 3, Practical Med., Series 1905.

I refer to the therapeutic test mentioned above, because it is probably the course pursued by many of us, but if this same treatment is followed in a tuberculous case, the patient is sure to suffer from the effects of the experiment.

In cases of mixed infection of tuberculosis and syphilis, there is no definite rule regarding the administration of Potassium iodide.

Knopf[3] says "if the digestive organs are good and the iodide of potassium is well borne and does not produce coryza or increase the pulmonary catarrhal condition, it can safely be given in doses of from five to ten grains three times a day; but of course the patient has to be watched and the iodide must not be given for too long a time. If it is not well borne, interferes with digestion, or produces or increases the symptoms which are above indicated, mercurial friction should be resorted to."

Some syphilitics do better under Potassium iodide, some under Mercury, and some under mixed treatment.

It has been stated that some cases of tuberculosis have improved upon mercurial treatment and I am inclined to believe this is so if given for a short time only. Certainly it does not do the mischief that iodide of potassium produces and I therefore recommend that if we must resort to the therapeutic measures for a diagnosis, we should inject Salicylate of mercury a few times and observe its effects.

Rarely should iodide of potassium be given to a tuberculous patient.

It has been my habit to suspend twelve grains of salicylate of mercury in one ounce of Benzoinol and to inject thirty minims into the buttock once a week.

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(3) In a personal letter to the writer.

CLEFT PALATE. REPORT OF CASE.*

BY W. W. CARTER, M. D., NEW YORK.

I have the pleasure of reporting this case from Dr. Harmon Smith's clinic at the Manhattan Eye, Ear and Throat Hospital.

The patient is 20 years old and had a cleft involving the soft and and to a slight extent the hard palate. He also had a rhinopharyngitis and considerable hypertrophy of the posterior tips of the inferior turbinates.

He was operated upon October 10th and discharged October 17th. As you see, the reconstruction of the soft palate is complete, even to the uvula.

It is unnecessary to give the details of the operation before this audience, but I should like to call attention to a few important points that I believe are generally applicable in adult cases.

An easy method of freshening the flaps is to grasp the uvula end with a thumb forceps and pare off a strip with a sharp pointed bistoury inserted just anterior to the apex of the cleft.

Right and left angular probe-pointed knives are very useful in separating the tissues from the hamular processes, and in elevating the periosteum from the hard palate. (I use ordinary tonsil knives). When the tissues are thoroughly elevated almost up to the alveolar processes and relaxing incisions made through the flaps internal to the hamular processes, the apron of soft tissue should hang perfectly flaccid and we should be able to approximate the edges without the least tension.

It should be remembered that in the normal palate there is a decussation of the muscular fibres, especially of the palato-pharyngeus and if we are to have a functionally useful organ there must be accurate alignment of the pairs of opposing muscles. (The speaker has seen a failure result from the union of the palatopharyngeus to the palatoglossus). The sutures should be placed close together in order to distribute the tension. I prefer medium size iron-dyed silk, as it is less likely to cut through and not so irritating to the tongue as either silkworm gut or wire.

No after dressing is applied. The nose and throat are irrigated frequently with a physiological salt solution and the patient is fed for six days through a stomach tube introduced through the nose.

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*Read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, November 27, 1907.

Our aim in doing the operation is to improve the nasal respiratory passages, favor mastication, insalivation and deglutition and improve the pronunciation.

To get perfect speech after the palate operation:

First.—We must supply tissue that is capable of contracting and shutting off the nasal passages at the proper time under the stimulation from the motor center in the brain.

Second.—The ear must be trained to readily distinguish incorrect sounds in the pronunciation of words. The patient does not recognize his own defects in pronunciation while speaking, but does so when his speech is reproduced from a graphophone. This instrument therefore is useful in treating these cases.

Third.—In every case of cleft palate that has reached the age when the habit of speech has been acquired, there is developed a neuromuscular perversion. This results from the effort to use in lieu of a palate, the epiglottis, aryepiglottic folds and the ventricular bands in the pronunciation of words.

When an operation was first suggested to this patient, he said that I could not improve his pronunciation, that it was an hereditary defect, that his younger brother who had a palate talked as he did. I suspected that it was a case of acquired defect in pronunciation, and thought that if this proved to be the case, as it did, it would be of interest to show the two cases side by side.

The parents of these boys died when they were quite young, and they have always been closely associated and mutually dependent upon each other. In one the defect in pronunciation is due to his having no palate; and in the other who has a palate it is due to being taught by his brother to speak without using this oral instrument. The situation is certainly a very remarkable and instructive one.

Of the twenty-three consonant sounds, only two, namely M and N, can be correctly pronounced by a cleft palate patient.

"Say:—H-Q-S-U-X-YES, SIR, CHRIS."

You can see that the pronunciation by both parties is exactly the same.

In both of these men, there is developed a neuro-muscular perversion and defect in pronunciation that can be cured only by persistent mental training.

Since the palate in the one has been constructed by operation, the status of these two men as regards prognosis and treatment is practically the same.

69 West Fiftieth Street.

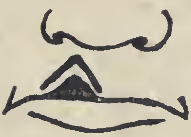
A CASE OF HARE-LIP OPERATION BY A NEW METHOD.*

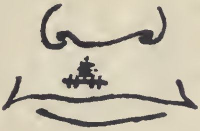
BY W. W. CARTER, A. M., M. D., NEW YORK.

Many of you will recognize this patient as having been presented at the last meeting in conjunction with a cleft palate case to demonstrate an acquired perversion in pronunciation.

The situation is so unique that I feel you will pardon me if I again make a passing reference to it. The parents of this boy, who is 18 years old, died when he was quite young and he was taught to speak by his brother who is two years older, and who has a congenital cleft palate. He learned to speak, therefore, without using his palate, and his pronunciation is the same as that of one having a cleft. His palate is perfectly normal but he does not know how to use it.

This patient had a congenital hare-lip that was operated upon when he was 12 months old, the result was not particularly good. A broad, moderately deep cleft remained, and the vermillion border was raised on either side of the cleft and the whole lip was filled with scar tissue. The cleft was so broad that to have pared the edges and united them would have left the lip too narrow and the vermillion border would have been irregular. There being ample tissue above the cleft I decided to do the following operation:





November 3 an incision was made through the labio-alveolar fold of mucous membrane and the tissues of the lip elevated from their attachments. An inverted V-shaped incision was then made through the thickness of the lip, an arm reaching down on either side of the cleft, but only to the upper limit of the vermillion border, the apex of the incision being above that of the cleft. The included pyramidal piece of tissue was then pushed downward by bringing together the arms of the V. This was done by tension sutures of heavy silk introduced through the entire thickness of the lip some distance from the wound. Approximation sutures of horse hair were used in bringing the edges of the wound together on both the cutaneous and mucous surfaces. The scar tissue from the previous operation was a hindrance during this procedure.

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* Read defore the Section on Laryngology and Rhinology of the New York Academy of Medicine, December 18, 1907.

A gauze dressing was applied and adhesive plaster stretched over it in such a manner as to pull either cheek forward. The dressing and stitches were removed on the seventh day. Primary union was obtained and the final result is what you see.

I neglected to have a photograph of the case taken before the operation, but I assure you that the improvement is marked, and I am sure that those of you who remember seeing the patient at the last meeting will agree with me.

I would recommend the operation for broad, shallow clefts, and especially where the vermillion border is raised.

69 West Fiftieth Street.

A Severe Case of Tuberculosis of the Tonsils, the Pillars, Uvula Pharynx, and the Naso-Pharyngeal Cavity, Quickly and Permanently Cured by Methylene Blue. T. BOBONE, de SAN REMO. *Rev. Heb. de Laryng. D'Otol. et de Rhinol.*, Oct. 6, 1906.

The patient was a woman of 54 years, much emaciated, who had suffered for a considerable time with severe pain in the deglutition. On examination there was found an immense ulceration occupying the whole of the posterior and lateral walls of the pharynx, the two tonsils, the pillars, part of the uvula and the edges of the velum palati. This ulceration was of an irregular form and was covered with a thick, yellowish-gray exudate, the removal of which left a bleeding surface. By means of a posterior rhinoscopy, the ulceration could be seen extending to the basilar apophysis and occupying the whole surface of the rhino-pharynx. The exudate caused difficulty in respiration. The nostrils were free of the disease; the larynx, with the exception of the pale color, was normal. There was a consolidation in the apex of the right lung.

The treatment consisted of free curetting of the tonsils, pillars and pharynx, drying with tampons of cotton, followed by an application of mercury cyanide 1-5000, and afterwards with a solution of 50 per cent. lactic acid; when the bleeding had been arrested a solution of methylene blue, 2-1000, was applied to the whole surface.

The microscopic examination of the debris of the mucosa removed by the curette showed the presence of the tubercle bacilli. The treatment was followed by rapid improvement. The application of lactic acid and methylene blue were continued. A week after the treatment was begun healing commenced and deglutition was easier. Two months later healing was complete.

SCHEPPEGRELL.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, Feb. 26, 1908.

WOLFF FREUDENTHAL, M. D. Chairman.

PRESENTATION OF PATIENTS.

A Case of Osteochondroma of the Septum with Extensive Absorption of the Cribriform Plate, Tumor Extending into the Cranial Cavity, Sphenoidal and Ethmoidal Cells.

By ROBT. MYLES, M. D.

DISCUSSION.

DR. JOHN A. BODINE said that he had not arrived in time to hear Dr. Myles' paper, but that he was very familiar with the case presented, and its surgical aspect particularly interested him. The first thing considered in the surgical management of this case was access to the growth, as it filled up the entire nasal pharynx, pushing outward one lachrymal bone, and in its upward growth had destroyed the cribriform plate of the ethmoid and pushed upward the frontal lobes of the brain. One can readily see that such methods as resection of one upper jaw or even dividing the face in the middle line, reflecting outwards both upward jaws, would have left us without adequate access to the upper limits of the growth. It seemed best, then, to cut the cartilaginous ends of the nose away from its attachment at the apertura piriformis, to chisel through the nasal bone along its articulation with the nasal process of the superior maxilla on one side, then to chisel through the line of articulation between the nasal bones and frontal, and by fracture of the opposite nasal bone, to lay the entire bony structure of the nose over the opposite eye. This gave us access to the upper limit of the growth. The second consideration was a safe and sane method of controlling hemorrhage. If one studies through the list of surgery, general as well as special, one finds the control of hemorrhage in this part of the body by ligation of special arteries in the neck. This is true of the lingual artery, the facial artery, and others. Now, as a matter of fact it takes considerably longer to isolate, identify and litigate these special arteries than it does to throw a ligature around the external carotid, and this is the best means of controlling hemorrhage during these bloody operations of the nasal pharynx that we have to-day. Some fifteen or twenty years ago some forty per cent of deaths were recorded from litigating the external carotid. To-day the aseptic ligature around the external carotid may be done in ten minutes with local anaesthesia and wholly without mortality. In this case of Dr. Myles, however, to control the hemorrhage, it was necessary to control the circulation in both external carotids, and while ligation of one external carotid is wholly without danger, the simultaneous ligation of both is a "horse of a different color." Upon the side of the face to which the fractured nose was reflected it was necessary to leave intact the external carotid so as to supply blood to the pedicle and secure healing after replacing the nose, and upon this side a temporary loop of catgut was thrown around the carotid and pulled taut whenever the hemorrhage demanded control. Such expedients as preliminary tracheotomy to prevent inspiration of blood into the lungs are, in my opinion, wholly unsurgical. The third important consideration was the choice of an anaesthetic. Dr. Bodine said that he believed it was safe to say that we are to-day on the eve of a revolution in regard to anaesthesia, and the man of to-day who uses ether or chloroform in all major operations, will, in a short time, find himself entirely in the wrong. This patient had chloroform during the last part of the operation, as the growth was being removed from the cranial cavity He had been given two tablets of hyoscine prior to the operation, while during the operation 1:500 solution of cocaine was used locally. The operation extended over two hours' of time. He went on the table with a pulse of eighty and came off with a pulse of ninety. At all times he was able to spit out the blood that ran into the nasal pharynx.

DR. L. A. COFFIN said that he would be glad to know whether in Dr. Myles' case the growth extended into the naso-pharynx, and what was the degree of malignancy.

He had a case of similar nature which he would report to the section.

A Case of Excision of a Tubercular Infiltration of the Epiglottis and a Brief History of Two Similar Cases. By J. W. GLEITSMAN, M. D.

The patient presented was not the one which Dr. Gleitsmann originally intended to demonstrate, as that one has been laid up with tubercular epidymitis for the last two weeks.

The patient presented was referred to Dr. Gleitsmann two years ago by Dr. Semken, and was operated upon at that time. He has been living in Baltimore for the last eighteen months, and has only recently returned to New York, and upon request reported himself at the office this morning. His epiglottis is fully cicatrized, and shows to better advantage than the case recently operated upon.

He was seen the first time February 9, 1906. He had then broncho-vesticular breathing at the left apex posteriorly, no expectoration, but he suffered from a dry cough, slight hoarseness and occasional dysphagia. The larynx showed a considerable infiltration of the margin and an ulcer of the epiglottis, and slight involvement of the left artenoid fold. At the first operation the diseased portion of the epiglottis was excised. Four days later the dysphagia had disappeared and the patient began to gain in weight. About a month later a small remnant of infiltrated tissue and the upper part of the ary-epiglottic fold was removed. A week later the patient was discharged, and was not seen again until to-day. He says that during the last few weeks he has felt a slight discomfort, which is due to an infiltration of the left ventricular band.

The patient, who is laid up is thirty-two years of age, and was first seen January 14, 1908. For two weeks previously he had been unable to swallow food to any extent. The entire edge of the epiglottis presented a hard, tense, and extensive infiltration, which was excised *in toto* at one operation, at the German Hospital. A week later he was discharged without dysphagia, and returned to his work.

The third patient was a married woman of thirty-eight, whose complete history is given in the Transactions of the American Laryngological Association, 1898, page 210. The epiglottis was one large ulcer which was excised, but many complications, especially tubercular ulceration of the tongue, had to be treated. Ultimately, after a year of treatment, the patient recovered completely and went to Europe, where, according to reports received a few years ago, she enjoyed perfect health.

A Case of Laryngeal Leprosy. By HOWARD FOX, M. D.

The patient is twenty-three years of age, although he looks twice that age. He was born in Trinidad, and came to this country when twelve years old. He lived in New Haven, Conn., for three years, then made Brooklyn his headquarters. , Shortly after coming to Brooklyn the skin lesions appeared. The throat symptoms first appeared three or four years ago, when he began to be hoarse and noticed sores in his mouth and throat. Within the past month a large ulceration of the palate has almost entirely disappeared. He has been under treatment of Chaulmoogra oil, which has apparently benefitted him. He has at times suffered from severe dyspnoea, which has been relieved by a cocaine spray.

Examinations shows well-marked macular lesions over the trunk and extremities, and the typical facies of tubercular leprosy. There is an atrophic rhinitis and perforation of the septum, deep ulceration of hard palate and pharynx, and extensive scarring of palate and fauces. The epiglottis is represented on one side by a swollen irregular mass, preventing examination of the cords and causing the dyspnoea.

DISCUSSION.

Dr. Rice said that way back in '79 and '80 he had seen four or five cases of leprosy at the Charity Hospital, but had seen none since. He had not had opportunity to examine this case, but in those that he had seen the larynx, epiglottis and arytenoids were very nodular in appearance and there was considerable enlargement. In one of them, the stenosis was so great that a tracheotomy was necessary. A variety of treatments were tried, but none of them amounted to anything. One or two or the patients died from general causes, and the others were lost track of. Dr. Rice said that the cases were all very interesting and he had published an account of them at the time. He would have liked to have seen if the pathology of this case was the same as of those which he had seen years ago.

Dr. Johnson said that he had examined this case, and it was nothing like those on the Island to which Dr. Rice referred. In this case there were very extensive ulcerative processes, as well as nodulation, involving not only the epiglottis but extending down to the cricoid cartilage and including the entire space between the folds, also ulceration of the tonsils and destructive processes all the way through the membranes of the nose and throat. There was also a perforation of the septum. According to his recollection only one of the cases on the Island showed any involvement of the larynx. They were show cases for quite a long time, the laryngeal case died as a result of exhaustion and laryngeal obstruction; the other cases were still there when he left the Island, and he has no knowledge of the question of laryngeal involvement or the final result.

Dr. Emil Mayer said that he had seen a case of leprosy in a young girl which involved the larynx, in addition to the external nose, lips and cheeks, as well as portions of the body. In the present case there were several points of much interest, viz.: The very large perforation in the nasal septum and the tumors in the posterior wall, and the tumefaction which prevents a view of the interior of the larynx. It would seem that ere long a tracheotomy was going to be required in order to relieve the dyspnoea. One of the interesting features of the case was the length of time the patient had lived in this country before developing the leprosy—fourteen years, before any sign appeared. Another question that arises is in regard to the contagiousness of the disease.

Case of Laryngismus Stridulus. By JAMES HARRIS, M. D.

Patient, man, 48 years old, eldest of fourteen children, twelve of whom are alive. Family history good.

Previous history: Has never been ill except for the laryngeal symptoms. No specific history, no sign of Tabes. Heart, lungs and kidneys normal. Nearly every night for the past thirty-five years he has been awakened with a choking sensation. The attacks were generally only momentary, causing him to rise to a sitting position, when they would pass off and he would fall back to sleep. After being fatigued these attacks were more sure to occur; also lying on the back seems to aggravate them.

The patient, a business man, has worked without a day of vacation for the past eight years, and for the past five months has been under great mental strain. He had the first typical attack of laryngismus stridulus about a year ago which lasted for about five minutes. He did not lose consciousness, but had to get down on his hands and knees in order to get his breath. Five weeks ago he had the first attack of the present series. At that time and for about three weeks he suffered also from a very bad laryngeal cough. The attacks vary from a hard coughing spell to croup, and then to the typical laryngeal stridulus lasting five minutes, during which time the patient runs about the room in an endeavor to inspirate. The attacks invariably occur at night. Four weeks ago, Sunday, he had almost a tonic spasm of the larynx for twelve hours, but of much slighter degree. He has seldom had more than one severe spasm in a night, but may have several slight ones. He had no severe spasm from the fourteenth to the twenty-first day of this illness. There was a slight congestion of the cords and larynx at first but this has now disappeared. The cords were covered with a very sticky mucus-which, when expectorated, checked the coughing spells. There are no other local symptoms. The case has been seen in consultation by Dr.

Felix Cohn and Dr. Charles Dana, among others. Dr. Dana failed to discover any nerve lesions.

The remedial agents have consisted in morphine, hypodermically at the height of the attacks, about three weeks ago—veronal, codein, heroin, acidum hydroc. dil., ammon. brom., potass. brom., sodium brom., syr. hypophos. comp., sodium iod. and iodized calcium. Locally, comp. tinct. benzoin inhalations were tried, but had to be discontinued on account of the nausea they produced. Adrenalin chlorid sol. 1-5000 was used in the form of a spray, but could not be borne at all. Chloroform is used to prevent the culmination of a spasm but cannot be used during the attack. Amyl nitrate has not given good results. Cold packs for the larynx were tried without good results, as was also hot antiphlogistin. For the past five nights a vapor cresoline lamp has been used with apparent good results. The patient has not had a spasm for the past two days, but last night was threatened with one which was only prevented by the use of chloroform.

DISCUSSION.

Dr. Felix Cohn said that he had seen the patient a few weeks ago in consultation with Dr. Harris and a neurologist. An absolute diagnosis was impossible. In the larynx, anatomically, the only change appeared in a somewhat elongated and pendant epiglottis. Examination of the cords revealed a slight tendency to adduction. On deep inspiration the chords did not move freely or as far as under normal conditions, and the impression from inspection was that there appeared pressure symptoms upon the recurrent nerve, such as are frequently found in an early stage of complete paralysis. A slight dullness over the sternum seemed to corroborate this view. As the affection dates from childhood and as a history of lues is absolutely excluded it may be assumed as likely that an enlarged gland might be exerting some pressure on the nerve; on the other hand, a spasm upon a purely functional or hysterical basis cannot be excluded. In regard to the prognosis, as far as danger to life is concerned, a study of the literature of this affection shows that it is somewhat favorable—death rarely resulting on account of the affection. Should, however, the recurring attacks exhaust the patient, a tracheotomy might be performed.

Pemphigus of the Soft Palate. By L. M. Hurd, M. D.

This patient, a woman, has been in the Manhattan Eye and Ear Hospital for two weeks, coming in for the condition of her eye. Soon after her arrival, she was sent to the throat department and we found a condition involving the soft palate and laryngeal walls. Two days later the picture changed, and Dr. Harmon Smith made the suggestion of pemphigus. Two days later two characteristic blebs appeared on the soft palate. The attacks lasted two weeks—sometimes very slight, sometimes severe. The lesions have never appeared on any part of the body. Dr. Hurd said that there were only a few similar cases on record. He was inclined to believe that this patient has also had pemphigus of the stomach, as she has had several attacks of neuralgia of the stomach.

DISCUSSION.

Dr. Harmon Smith said that there seemed to be an understanding between Dr. Hurd and himself as regards reciprocal favors in diagnosis, for three years ago he had presented a case of pemphigus of the throat to this section, in which instance he had been treating the patient for specific conditions, believing the patches seen upon the soft palate to be mucous patches, but upon one occasion the same patient was treated for some ear trouble by Dr. Hurd, and he recognized at this time typical pemphigus blebes upon the palate and immediately called attention of the throat department to the condition.

This woman later suffered intense gastro-intestinal pain, finally becoming so weak that she was unable to attend the clinic. It is very probable she died of gastro-intestinal involvement, which is the ultimate outcome of these cases.

Unless the case is seen at the time of the eruption the clinical aspect is very similar to syphilis, and only the pain evidences the existence of pemphigus.

A Consideration of the "Herd" Theory as an Etiological Factor of Ozaena. By Clement F. Theisen, M. D., Albany.

The Pathology of Atrophic Rhinitis, With Ozaena. By D. Braden Kyle, M. D., Philadelphia.

The Treatment of Atrophic Rhinitis, Including Ozaena. By G. L. Richards, M.D., Fall River.

By R. C. Myles, M.D., New York.

Dr. Rice was asked to open the discussion, and read a short paper embodying his views on the subject.

The papers of this Symposium will be published in full in a subsequent issue of The Laryngoscope.

DISCUSSION.

Dr. Delavan remarked that he had very little to add to what had already been well-said.

With regard to the frequency of the condition, he agreed with Dr. Rice. He had seen fewer cases relatively in late years than in the earlier days of his practice, and he thought Dr. Rice was right in attributing this decrease to improved nasal hygiene and better understanding of the conditions.

With regard to the pathology of the disease, there is little new knowledge and it was desirable that more should be known about this branch of the subject. He had listened to Dr. Kyle's statements on the subject with great pleasure. He had himself believed for a long time that these cases did not all represent one and the same disease, but that there were several varieties to be found and that they demanded recognition, and that it was necessary to recognize this in discussing the methods of treatment. Not all forms of treatment were adapted alike to a given form of the disease.

One type of the disease not mentioned to-night was the condition of atrophic catarrh that is often seen behind the nose and in the vault of the pharynx, sometimes due to adenoid hypertrophy, and sometimes arising where there has been no appearance of adenoid hyperthrophy. These cases are serious on account of the tendency which they show to travel down the Eustachian tubes and affect the ears, causing a type of deafness very difficult to deal with.

With regard to treatment—anything of an astringent nature is contra-indicated, which idea, together with other valuable contributions to the subject, was taught by Dr. Bosworth years ago. In the speaker's own opinion the most effective form of treatment consists in thorough, persistent, long-continued, and effective irrigation and effective cleansing by such means as might be selected, followed by some form of stimulation, and in some cases, by the application of oily sprays. The use of medicaments, cotton plugs, and electricity in various forms all seem to depend for their results on stimulation of the mucous membrane. In cases where the disease was not too chronic he obtained the most satisfactory results by stimulation, combined with irrigation, and even in the most chronic cases much could be done through the patient application of proper means. He had used the constant current by various methods of application and had had a number of successful cases, but none of these belong to the old, inveterate, and apparently hopeless class.

Dr. Jesse E. Newcomb said that he had been greatly interested in the papers of the evening and had nothing to add concerning the pathology or treatment of the condition. The latter embraced two main features—cleanliness and stimulation. It was not difficult to relieve the main discomforts of the affection to both the patient and his environment, but in many instances the so-called cures necessitated a continuance of home treatment for an indefinite period, perhaps for life. There was no sovereign remedy—fidelity in the application of any one would do all that was possible. though the alteration of remedies was not without its utility. He did not think it was quite right to speak of restoration of the internal contour of the nares by paraffin injections as a cure of ozaena, although they did to a certain extent restore mechanical conditions. They could not restore atrophied secreting tissue.

Of late the point of special interest in his own mind had been the possible relation between the nasal condition under consideration and tuberculosis. During the last few years he had examined several hundred applicants for admission to one of the Adirondack sanatoria, and while no systematic records had been kept of intra-nasal findings he had the very definite impression that atrophic conditions were no more common in this number of patients than would be the case in an equal number of unselected cases under any circumstances. The patients referred to were mainly tenement dwellers, living under a poor environment. Since January 1st of the present year he had recorded the exact intra-nasal findings, and in twenty-one cases thus far examined hypertrophic rhinitis had been found in one, slight atrophy in three, moderate atrophy in two, ozaena in one, and the remaining fourteen were practically normal.

Perhaps the most exact and important contribution to this subject was the paper of Dr. Arthur Alexander, of Berlin, in vol. xv. of Fraenkel's Archiv. Dr. Thiesen had also presented an interesting paper on the matter at the Atlantic City meeting of the American Laryngological Association. in 1904. Alexander gave a table of autopsy records on ozaena patients, and found in a large number that in three-fourths of them the cause of death was pulmonary tuberculosis. Furthermore, in fifty ozaena cases of living patients, tuberculosis was found in nearly half. Finally, in one hundred cases of tuberculosis, ozaena was found in three and one-half per cent, and simple atrophic catarrh in one and one-half per cent. The figures of other authors did not materially differ.

This matter of the relation between the two affections was confessedly a very obscure one, and it was not surprising that a multiplicity of theories existed. Perhaps the most recent contribution to the topic was that of Caboche, whose main thesis was that ozaena is a latent form of tuberculosis. While perhaps his reasoning was not conclusive. he had brought forward some interesting facts. Experimentally, he inoculated ten guinea pigs with pieces of tissue from the inferior turbinate of an ozaenatous patient, the inoculation being made in the vagina in five cases and in the peritoneal cavity in five others. All these results were negative. He calls attention to the difficulty in making positive inoculations with tissue as distinctively tubercular as is lupus tissue, and thinks that ths same refractory qualty inheres to ozaen ous tissue.

Of more interest than these experiments, however, were the views of Caboche with reference to the histories of those families in which both tuberculosis and ozaena had been relatively common. He found that tuberculous parents gave birth with notable frequency to ozaenous children, and that on the other hand an ozaenous mother might and did by a sort of phenomenon of reversibility, as he terms it, give birth to tuberculous children. And this did not seem to be a mere coincidence, for he found that the death rate from tuberculous diseases in the children of this class of mothers was unusually large.

Finally, he called attention to the advisability of watching ozaena with reference to the matter of possible contagion in the disease. Much that was fanciful had been written on this special phase of the subject, but the facts which had been collected by Perez and Lermoyez could not be overlooked. The former's theory that the disease was propagated by dogs' nasal mucous was not as yet to be taken seriously. Lermoyez's account of a series of cases which he described as if they were syphilis, and then stated that he had been playing on the credulity of his hearers and that they were in fact cases of ozaena, might not be the most exact method of propagating scientific truth, but the facts were there and it was difficult to deny them. The deduction was that in every case, as soon as discovered, ozaena should be vigorously treated and brought to that stage in which the results secured by the physician could be maintained by the patient's own home treatment.

Dr. Hurd called attention to same points which although brought out as predisposing causes seemed to him to be hereditary. Several children affected in one family seemed to indicate not so much contagion as heredity. There certainly are different classes of this affection and Dr. Kyle had summed the matter up very thoroughly. In cases with a large nares on one side filled with crusts, sometimes with a bad odor and sometimes not—a good result is often obtained by equalizing the two cavities and putting the septum in the median line. The submucous operation does not give as wide a septum as might be desired in such cases. Lately he had seen a case which had continued for three years without odor. Citric acid seems to be one of the most satisfying remedies for the bad odor cases, in connection with cleansing of the nares. Routine treatment is very effective. One of his assistants has paid a great deal of attention to such cases, simply cleaning out the crusts and applying ichthyol three times a week, and teaching the patients to do it for themselves, and has obtained some very satisfactory results.

Dr. W. W. Carter said that we were not in a position to accept the "Herd" theory unreservedly as to sinusitis being always the cause of atrophic rhinitis, although a great many cases of atrophy of the nasal mucous membrane are caused by sinusitis. These cases, however, can be put in a class by themselves, and are not identical with the specific disease recognized as ozaena. Certainly some such classification must be made if we are to accept ozaena as a pathological entity. He has a case under his care at present that is very instructive, and although one can draw no conclusions from one case, certainly this one throws considerable light on the situation. The patient has a sinusitis with marked atrophy of the mucous membrane on one side, while the other side is apparently normal. There is not the characteristic odor of atrophic rhinitis in this case.

In regard to the odor, Dr. Carter said that there is certainly something else to account for the peculiar fetor other than the decomposition of the secretion in the nose as stated by most writers. He has cleansed the nasal cavities thoroughly, and yet he still observed the characteristic odor of ozaena. He said that in addition to the atrophic changes going on in the mucous membrane, there is also a gradual disintegration and disappearance of the bony tissue, and it seemed to him that the odor of the disease is somewhat similar to that of necrotic bone. Dr. Carter thought, therefore, that the peculiar odor might be due to the products of the molecular disintegration of bone constantly going on in these cases, and he wished to offer this as a probable cause of an, as yet, unexplained phenomenon.

Dr. Theisen in closing the discussion, said that he wished to emphasize the importance of infectious diseases in early life as a factor in the causation of this disease—scarlet fever, diphtheria or measles. These diseases in many instances produce an infection of the accessory sinuses, where it lingers, sometimes for years, and affords a good preparation for the development of ozaena. His assistant is always instructed to investigate the history of such cases. He appreciated the fact that Dr. Myles was in accord with this theory. All know that the purulent rhinitis of children is probably due to infection of one or more of the accessory sinuses. While it is sometimes a purulent infection pure and simple in the majority of the cases, it is the result of infectious disease. This is the most important point in connection with the Herd theory.

Dr. Kyle, replying to Dr. Myles' remarks, said that this point bears out the claim he makes that there is not any one first stage. There are so many causes that it is almost impossible to get at any one first stage .It may be that there is an inherited weakened tissue, and the nose is easily infected and tends to catarrhal conditions, or there may be a tendency to tuberculosis, or inherited syphilis. What gives rhinitis in children, if it is all due to one germ? Does one child get it from another?

If you treat and study the process known as atrophy of the mucous membrane, with or without ozaena, you will find that it is not a specific disease in many cases. He had seen many instances where, as soon as the atrophic process was relieved the ozaena disappeared. In some cases where the process was stayed, the patient had a fairly good mucous membrane.

If one studies the cases from the clinical end only, and tries to make out the inherited condition, lowered powers of resistance, etc., he will probably find some underlying cause, but he did not believe that pathological studies would show any one cause, and that is why it is difficult to get at the first stage of the disease.

For many years he made a study of the chemical conditions, and in many of the cases where the patient has auto-infection there was an excess of sulphocyanides, but in other cases this did not appear; but where there was a degenerative change in the tissue—where it was in the tissues and gland structures—every one showed chemical change.

Dr. Richards said that he had nothing to add to what he had already said on the subject of treatment. It only remains to study the etiology and make it contribute so far as possible in the selection of the remedy, and to keep the nose clean. The patients are mostly relieved and occasionally they are cured.

PRESENTATION OF INSTRUMENTS.

Dr. Bryson D. Delavan presented a number of instruments devised by the late James H. Goodwilie—saws, drills, cautery tools, etc., some of which were exceedingly ingenious and effective, and a few of which are still in use. He hoped that this set of instruments would help in handing down to posterity the name of one of the most useful men of this city.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeing, February 11, 1908.

A. H. ANDREWS, M. D., PRESIDENT.

Anatomy of the Frontal Sinus. By J. G. WILSON, M. D.

Opening the Frontal Sinus. By R. H. GOOD, M. D. (Published in full in this number of THE LARYNGOSCOPE, page 266.)

DISCUSSION.

DR. JOS. C. BECK: I had an accident during an intra-nasal operation done according to Halle's method. The result was a local meningitis. Halle's, Ingals' and Good's methods seem to offer practically the same chance for danger. I find that the greatest difficulty with these operations is the getting into the frontal sinus. Dr. Good says that the whole sinus may be drained by his method, and the others make the same claim. I have a radiograph of one case which shows that it is impossible because the sinus was bisected by a bony septum. I cannot see how any of these methods would drain that sinus. Of course, an intranasal operation is preferable to the external operations, and it seems to me that Dr. Good's method is a valuable one, especially the use of the rasp. I will give the method a trial for that reason.

Dr. Wilson's means for measuring the cribriform plate of the ethmoid will be of very great value to us. I have been trying to do the same thing by means of skiagraphs, but the method is more difficult and not as accurate as Dr. Wilson's.

DR. A. M. CORWIN: The demonstration of Dr. Good's method was very nice indeed, but fill in these cavities with mucous membrane, and pass into it an instrument of the size of this rasp, and at this angle, and I fear that it will inflict considerable damage all along the tract. We should be sure to injure all the structures and cause the formation of adhesions, militating against the possibility of perfect drainage. To pass this rasp well up into the frontal sinus it seems as though we should have to go into the mouth and through the palate, judging from the skull which is being used as a model.

DR. GEO. E. SHAMBAUGH: For the relief of most of these frontal sinus cases intranasal work is all that is required. Even in the majority of the chronic cases the radical external operation is to be done only when we do not get satisfactory relief from the severe symptoms by an intranasal operation.

I am especially pleased with the elaborate details Dr. Good worked out, but there is one point that must not be lost sight of, and that is confusing the idea of a radical operation with that of best results.

The most radical operation will often not give as satisfactory result as the more conservative procedure. This is especially true in the frontal sinus cases, when the choice is to be made between an external operation and an intranasal one. And in the intranasal operation for the drainage of the frontal sinus the most radical tearing up of these parts does not necessarily assure results better or even as good in the majority of cases as more careful, conservative procedure.

My work usually consists of using forceps to remove the turbinate body and to get out the anterior ethmoid cells, and I usually get satisfactory drainage in that way. One can take out the entire ethmoid labyrinth with these forceps. The one instrument shown by Dr. Good that appeals to me the most is the rasp to be used to enlarge the frontal sinus opening. But the question arises whether it is necessary to use this rasp if the opening present is sufficiently large to admit the rasp. It is only when the opening is obstructed that symptoms are likely to be annoying, so that if you can pass in the rasp there is usually no obstruction, hence no symptoms. I should be inclined to try it, however, where the usual intranasal operation did not give results.

In regard to the operation for removing the floor of the frontal sinus with chisels. This can no doubt be successfully accomplished in cases where the posterior wall of the frontal sinus is separated by a considerable distance from the anterior wall. But there are other cases where a study of the relations in a cadaver shows that such an operation is practically impossible without breaking through the cribriform plate. I will pass around an anatomical preparation where this is the situation. Here the cribriform plate extends fully one-half inch anterior to the opening of the naso-frontal duct. In this case even if it were possible to work with the protectors which have been shown this evening, which I hardly think could be used in such a case, I do not see how a chiseling operation can be done without great probability of injury to the cribriform plate. The narrow chamber in which this work must be done prevents the placing of a chisel at such an angle as to obviate in any way, it seems to me, this danger. In this specimen, for example, the opening of the naso-frontal duct is scarcely one-fourth of an inch from the cribriform plate. I can hardly conceive the possibility of using a chisel even on the cadaver where the view is not obscured by swollen and bleeding tissues without the probability of fracturing the cribriform plate.

As to the danger of exposing the dura in such operations, we have learned from our work upon the mastoid that the mere exposure of the dura, provided this is not injured, is not fraught with any degree of danger. In the case of the frontal sinus, for example, the exposed dura on the posterior wall of the frontal sinus need not necessarily increase to any great extent the danger of the operation. An injury to the cribriform plate, however, is quite a different matter. This plate is perforated by numerous nerve filaments and lymphatics, which brings the dura into close relation with the intranasal cavity. A mere fracture of the cribriform without so much as a perforating wound, must result in considerable laceration of these prolongations, and open the way to a most ready infection in this part.

As far as I have been able to judge of the several intranasal methods of enlarging the opening of the frontal sinus into the nose, it seems to me that the method which has been devised by Dr. Ingals, that of passing a burr over a pilot, presents by far the safest method that has yet been suggested.

Dr. J. Holinger: The intranasal treatment for chronic suppuration of the frontal sinus will never entirely take the place of Killian's external operation, although the latter is indicated in only a few cases. The opening and drainage of the different sinuses is not the only indication for our therapeutical endeavors. The mucous membrane is usually affected in such a manner as to continue to make trouble, even though drainage is perfect, as the following case will demonstrate. A surgeon of this city opened up all the sinuses in a case which took him three months to accomplish, but he never thought of washing them out. The patient was not at all relieved. I washed out the sinuses with boric acid solution, and every symptom disappeared at once. The sinuses were filled with decomposed pus and mucus, and a very few washings were sufficient to ease the most distressing symptoms.

Another point: The bones in the upper part of the nose in these old chronic cases are not normal, but are extremely brittle. Any instrument in the duct may easily injure the bony septa. One may even break through any cavity, and into the skull, with an irrigation tube or a probe without using any force at all. Therefore, one must be very careful in these cases. It has happened twice to me to have a patient collapse during the washing of the sinus. In one case I saw at a subsequent operation that the inner plate was necrotic, and that the fluid had probably forced its way into the extradural space.

As to the experiments of opening the sinus from the nose, it must be said that the skulls which have been shown here are normal, and the arrangement of the sinuses is normal. The most stubborn cases, however, are those where the arrangement of the sinuses is abnormal. In order to illustrate this point allow me to remind you of the young woman I showed here a year ago. She had to be operated upon her *left* frontal sinus. The *right* sinus extended over both sides, and the left one was only a small slit containing ill smelling pus in the depth of the orbit, where no intranasal treatment could reach it. All of these cavities are lined with mucous membrane, which is at the same time periosteum. You rasp this away and lay bare the bone. What happens? Granulations will form which will produce pus and necrosis, thus causing the very condition you wish to overcome. I am very careful in using the curette in any of these cavities. It is a different matter to break away some parts with a forceps than to enter a bleeding cavity with a curette or rasp. I should hesitate to do so. It is very easy to injure or scrape away this thin mucous membrane, but what are you going to put in place of it?

Dr. J. G. Wilson: So far as Dr. Good's operation is concerned, I believe that the best way to go into the frontal sinus is by the intranasal route, but there always will be a few cases where one cannot get into the sinus in that way. One thing is certain, that before a man does Dr .Good's operation, he should ascertain the position of the nasal duct, and its relation to the cribriform plate. If Dr. Good, in the majority of his operations simply removes the ethmoidal cells to secure drainage, I am positive that he would get the desired effect.

In regard to the question of exposing the dura, I do not think that that does any harm whatever; but perforating it is a different matter, because the lymphatics of the dura lie not external to it, but in the arachnoid space, and this is continued down over the olfactory nerves as they pass into the nasal cavity. If one exposes the dura, very little damage may be expected, but if he perforates the dura, I should say that the danger would be great.

Dr. R. H. Good: Dr. Corwin doubts whether the rasp enters the frontal sinus. By looking at this recent preparation with the front wall of the sinus removed he can readily convince himself that it enters into the sinus.

Dr. Ballenger is right when he says that the rasp looks rather crude to him; but better ones are being made.

As to the dura, I do not think it dangerous to expose it, but if it is perforated, meningitis will nearly always follow, providing you do not make a large opening and insert a gauze drain.

I saw a case of cholesteatoma of the frontal sinus in Vienna, which had a perforation of the posterior bony wall of the frontal sinus as large as a dime. After removing the cholesteatoma, the doctor perforated the dura with a small knife for diagnostic purposes, and the patient died in five days from Meningitis. I believe in keeping away from the inner plate of the frontal sinus, which is easily done by my method.

In reply to Dr. Shambaugh, I would say that my operation is only done in cases where the ordinary methods have failed.

The cribriform plate is not in danger, as the chisel is directed externally to this structure, and passing at a tangent to the orbital wall. The structures which may be damaged are the lamina papyracea and the lachrymal bone, and these can be protected by the assistant.

Dr. Hollinger favors Killian's operation, and I know that all four of my cases would have been operated by Killian had they been his patients. Furthermore, all the operations I saw in Europe on the frontal sinus, except one, had been operated on once or twice before.

PRESENTATION OF INSTRUMENTS.

Dr. L. Ostrom exhibited an Antrum Forceps.

Dr. F. E. Brawley exhibited an Irrigation Apparatus for the Nasal Accessory Sinuses.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

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A. W. DeRoaldes, M. D., President.

(*Continued from the March number, page* 240.)

A Case of Spasm of the Esophagus. By John W. Farlow, M. D., Boston.

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DISCUSSION.

Dr. H. L. Swain: I have never seen a case of spasm of the esophagus just like this. Before hearing the paper, I was interested to learn what sort of case Dr. Farlow was to relate to us. On Thursday last, a patient came in during my office hour and said that he had been unable to swallow for eighteen hours. Not a bit of moisture could possibly be gotten down his throat. His throat was not sore. During the last three years he had occasional attacks of the same kind, lasting about ten or fifteen minutes. Two weeks before he had had one lasting an hour, during which time he had fainted; and some doctor whose name he does not know had been called in, and had passed an esophageal bougie. This had relieved his spasm.

This patient gave a distinct point of issue of the spasms. It was situated upon the left side of the throat. There would be a painful sensation, and resulting from that was something like a cramp in the throat. From then until the throat relaxed, he would be unable to swallow anything. At his visit to me he made an attempt to swallow water, but regurgitated it with intense spasms. All the muscles drew up, as in stiff neck. Being now interested in esophagoscopy and bronchoscopy, I looked down into the esophagus with great pleasure. Mindful of the fact that he had said that there was something on the left side, I cocainized the left sinus sigmoidius. I passed the esophagoscope and the probe down farther and farther, until I struck a point that he said was the place, just below the level of the cricoid. Then the spasm let up; and as I took my instrument out to let the cocaine work, he said: "I can swallow." I handed him a glass of water and he swallowed it with composure.

I then tried an esophageal lesion; and, passing the esophagoscope down again, I discovered a round swelling on the left hand side, just below the cricoid cartilage—about 25 cm. down from the teeth, as marked on the tubes. That ball was somewhat eroded. The patient was not a good subject for examination; and, not being very skillful, I did not get a good view. I put on a simple five per cent. nitrate of silver solution, and expected to see him again before coming away, but evidently he was able to swallow from then on, as he has not shown up.

Inquiry as to his habits, in order to get a more definite idea of the pathological conditions, developed nothing. He was an inordinate drinker of indifferent whiskey; otherwise, there was no glandular swelling or enlargement of any kind.

He said that constantly during the last year he had had such difficulty with his throat. During the time the spasm is on, absolutely nothing can pass down. He apparently has the same sensation in his esophagus as he would have if the cramp were in any other muscle. I hope some time later, perhaps, to extend this report; but the case was very interesting to me in connection with Dr. Farlow's paper.

DR. W. E. CASSELBERRY: I regret that Dr. Farlow did not make a trial of cocaine, even though the esophagus was in such a spasmodic state that there was no hope for it to pass through the constricted point. I recall, in this connection, not a spasm of the esophagus, but a case of dysphagia spastica (which has been recorded), in which a gentleman with such a spastic condition, attempting to speak, would be unable to do so, and in which a cocaine spray applied to the nose enabled him to speak in half an hour or an hour. There is something in the absorption of the cocaine; for in its application to surrounding surfaces, enough passes through to near the place of spasm to influence a spasmodic condition of the muscles in these parts. The cocaine might have had no effect in Dr. Farlow's case, but it would seem to be worth a trial and would be harmless. The solution should be applied to the constricted esophagus as near as possible to the point of spasm.

Again, I recall a case in which there was such a spasmodic state; but nothing like the one described in intensity, and not enduring so long. It was in an elderly gentleman. In an elderly person, with symptoms of dysphagia, one instantly thinks of a possible carcinoma of the esophagus; but this man had given a history extending over six years of his life, without any aggravation of the condition. So, although I could not exclude carcinoma, I did not think he had it. The condition was not always present. Sometimes he would not have it for two or three months, and then it would be present for two or three weeks at a time. At such times, on attempting to swallow special articles of food—acids, for instance—he would have a constriction of the esophagus, which he located at the upper part. He would be unable to proceed with his meal, but would choke and have to rise from the table.

Investigation in his case was pursued in the following manner: First, attempts at passing esophageal bougies of various sorts were made; and I was utterly unable to pass one. Every time the attempt was made the esophagus, in the region of the cricoid, or below, would constrict. He was then anesthetized. I told him that this was necessary for a positive diagnosis. Ether was given to the point of surgical anesthesia, and bougies were passed. Somewhat to my surprise, bougies of any caliber were found to slip down with the utmost ease. There was no point of constriction. I used Einhorn's esophagoscope without any trouble whatever. I got a good view and could see nothing abnormal in any way. The man is still alive. This was about eighteen months ago. He is neither worse nor better, and suffers still in the same way.

DR. L. A. COFFIN: These cases would seem to be of disordered reflexes, and I presume that we have all had spasms of the esophagus with certain stimuli or with irritation at the proper point. There seems to be some change at the point of the peripheral sensory nerves.

This recalls an interesting case that occurred a number of years ago. A boy twelve years of age had never been able to swallow anything solid; and his family could not take him to ordinary hotel-tables, etc., as they felt ashamed to have him sit down in public and eat only Mellin's Food and milk. I was asked to see him. I could not form an opinion as to the cause of the constriction, but I did know that the child had adenoids. I thought he would be better off with them out, whether their removal had any influence on his deglutition or not. They were removed, and the next day he could swallow all right. He has had no trouble since, and I believed it to have been due to this disorder of the nerve ends. I should think that cocaine would be just the thing to relieve this condition—temporarily, at least.

DR. E. FLETCHER INGALS: I now have under observation, and have had for some weeks, a case similar to that reported by Dr. Farlow.

It is that of a lady about forty years of age, not hysterical, and presenting nothing wrong in her appearance, except that she looks anemic. She has had the spasm of the esophagus, much like that of this patient, for a number of months; and while she has been under my care there has been a gradual improvement under the use of tonics and bromides. In much the same way, I have used these remedies before for spasms of the esophagus and pharynx. I did not get any very satisfactory results until I began introducing esophageal bougies, employing pretty large ones. Each time this gave decided relief, and I found her better at her next visit. I think that this method of treatment will effect a cure in her case. At one of the treatments I used cocaine before passing the bougie, to relieve the patient's discomfort. I had previously passed the bougies without the cocaine; and the patient said she preferred it without cocaine, as she did not like its after effects. There would, I think, be no difficulty in passing an esophageal swab with cocaine on it, to relieve the patient's discomfort at the time; although, inasmuch as the spasms are usually relieved after a few minutes, I do not think that there is much use in doing so. They get over it about as quickly as they would get over the bad results of the drug.

Prof. Gustav Killian: I have had some experience in spasms of the esophagus, having seen a great many cases. In order to reach a correct diagnosis it is necessary to exclude changes in other organs. If the patient has a stenosis of the esophagus, or a carcinoma, this must be excluded. If nothing else can be found to account for the condition, we may then consider it to be a spasm of the esophagus.

Spasms of the esophagus cannot be cured until we learn their origin. There are two kinds of spasm of the esophagus, primary and secondary. I have seen cases in which the origin of the spasm was a disease of the stomach. That organ is frequently diseased; and then we have to cure the disease of the stomach, if we wish to have success in our treatment. In other cases—which, I think, are the most common—we find that the patient eats too rapidly—that he does not masticate sufficiently, and swallows his food too quickly. I have found patients that have taken their dinner or supper in ten minutes. Among such persons, it is clear that there will be some cases of spasm of the esophagus or of gastric disease.

It is very interesting to be able to demonstrate to the patient that eating too rapidly is the cause of his trouble. I do this by means of a little instrument that I have invented. It consists of five plates, one above another, in each of which are holes. The size of these openings gradually diminishes from the top to the bottom, those in the latter plate being quite small. I give the patient a piece of bread to masticate. When this is ready to be swallowed, I have him spit it out; and I wash out the mouth with water. He takes out the instrument; and he can then see that most of the bread is under the first plate, and not—as it would be in normal cases—at the fourth or fifth. The particles swallowed have been too large to pass through any but the upper holes.

Dr. A. W. de Roaldes: I would call to the attention of the society the fact that some of these cases of spasm of the esophagus may be secondary to some disease of the nervous system, especially tabes. This fact should not be overlooked. In the tabetic condition of certain patients that have come under my observation I have noticed the frequency of spasms in some cases. These occur not only in the advanced stage of the disease, in which spasms, sometimes of a clonic character, like ordinary cramps, are frequently noticed, but also in the early stages. I remember a case in which the patient had suffered for nearly two years with spasm of this kind, but clonic in character. This was not diagnosed in the beginning as to its origin, but was simply treated and unrelieved. Two years afterwards the case was reported in Europe as having developed tabes. The spasm continued for many years, and finally the patient died a tabetic.

I should, therefore, like to call your attention to these spasms; because they may constitute a prodromal condition of a case of tabes.

Dr. G. Hudson Makuen: Gentlemen, I am inclined to think that many of these cases like those described by the reader of the paper are analogous to the condition referred to by Dr. Casselberry as dysphonia spastica; and that there is a nervous, or psychical, element in them. The patients cannot swallow, because they think they cannot, or fear they cannot; and they always do better—whether in swallowing, in vocalization, or in the use of speech—when under some form of mental exhilaration. This may explain why Dr. Coffin's patient did better during the dinner he gave him. These dysphonia spastica cases will always do better during periods of exhilaration. I think, perhaps, that this will explain the effect of cocaine largely. I believe that it is more the systemic effect of the cocaine that produces the good effect in such cases than its local effect. The patients are in a state of mental excitement.

The normal man will talk more and better under the effects of cocaine.

I also wonder whether this condition may not be similar to the condition one sometimes finds in slight paresis of the pharyngeal muscles. I now have under my care a little fellow who has great difficulty in swallowing, due to unilateral paresis of the pharyngeal muscles. If the paralysis were bilateral, it would be rather difficult to diagnosticate it; but, being unilateral, it pulls the palate to one side, and I can see the true condition. The trouble comes on only occasionally. At such times he has to throw his head to one side and twist his neck, in order to get the bolus down. The patient improves under electrical treatment of the pharyngeal muscles.

DR. FARLOW, closing: The discussion has been very interesting, but it has not given me any suggestion as to how such a case should be treated in the absence of the physician. The hints that possibly exhilaration might be an aid would hardly apply in my cases, because in several instances the spasm came on during the progress of a luncheon to which a number of persons had been invited, so that the patient was in considerable exhilaration. It could not, also, have been caused by insufficient mastication, or by swallowing large pieces of food too quickly. In the uncle and the father of the patient, who each suffered in the same way, the attacks came on with the first mouthful, which was often only soup without any vegetables in it and containing no irritable substance in the form of salt. Therefore, my cases are not of that character.

As regards cocaine, we should not use it when a spasm is first coming on; because it is possible that the spasm may be but momentary. If, however, it has been persisting for fifteen or twenty minutes, the mouth will be full of saliva; and I do not think that in these circumstances the cocaine would act. The patient is in great distress during these spasms; and I should be loath to pass anything with an irritating substance of any kind on it, or an instrument of any size, down the esophagus of a person gasping for breath. It is a very distressing case; so that forms of treatment that can be used in the dispensary for patients with chronic and frequently recurring spasms are not applicable to a case in which the patient is in perfect health between the spasms. I have seen her recently. She was then about to go away, and wanted to know whether there was not something that she could take with her to relieve the spasm; and I am sorry to say that I have been unable to give her any suggestion.

DR. MAKUEN: Would the distress take place if the bolus she attempts to swallow were in a fluid condition?

DR. FARLOW: There is nothing more fluid than clear soup.

DR. MAKUEN: I do not understand the physiology of the phenomenon. I should think that the soup would be regurgitated.

DR. FARLOW, closing (concluded): I referred to the uncle and the father as having had a series of attacks through many years. An aunt has similar attacks, as does also a sister. There seems to be some family peculiarity about it.

Some Considerations Relative to the Lymphoid Tissue of the Fauces in the Systemic Infections. By J. L. GOODALE, M.D.

Many infections enter the system through the pharyngeal follicles in the absence of tonsillar involvement, or after the tonsils have been extirpated. A case of infectious arthritis was reported in which temporary improvements in the joints followed the removal of the tonsils, but which later showed a recurrence of the arthritis repeatedly is associated with acute follicular pharyngitis. It is probable that the infection in such cases is through the central invagination of the individual follicles of the pharynx. The site of the follicular crypt may be indicated in acute inflammation by a small white spot, which is composed of leucocytes and at times fibrin. A consideration of such cases emphasizes the important part played by the host, since it has been demonstrated that an infection may take place through normal lymphoid tissue. A. A.

DISCUSSION.

DR. W. E. CASSELBERRY: I am very glad, indeed, that Dr. Goodale has drawn attention to the lymphoid tissue in what I had been accustomed to term the angles of mechanics. Of course, isolated follicles also exist all over the posterior wall; but behind the posterior pillars of the fauces there is a chain of lymphoid follicles grouped closely together, and capable of acute tonsilitis or acute infection. They are also frequently found chronically hypertrophied, and are then still more susceptible to acute infection. This is an old focal condition of the lymphoid tissue of the pharynx, so far as the enlargement of the follicular tissue in the angle is concerned; and it is called pharyngitis lateralis, or implication of the lateral portion of the pharynx. It is, however, the lymphoid tissue that is the vulnerable point of infection, undergoing inflammatory reaction, and causing the systemic condition.

I have also been conscious for a long time that this chain of glands is, in part, responsible for the systemic infections under the name of acute rheumatism, acute endocarditis, etc.; because I have repeatedly observed it in children and adults upon whom I had made a thorough tonsillectomy. There would subsequently be, in these cases, attacks of lighter degree; and I would find the lymphoid tissue in the angles in an acute state of inflammation, and it was evident that the whole of the absorbing surface had not been removed. In such cases, I have always destroyed these glands by the use of the cautery. It is a flat surface, not well adapted to excision, but adapted to cauterization. By making a loop of wire, one can reach behind the pillar, above the velum, and down into the pharynx; and one can there destroy the chain of glands; which is of eminent benefit from the standpoint of acute inflammations and to the pharynx as a whole, when chronically hypertrophied.

Dr. R. C. Myles: This is a subject that I am particularly interested in, and I feel very much indebted to Dr. Goodale for the light that he has given me. I do not know why we have written and talked and thought so much about the tonsils and the systemic infection occurring through them, and have been so slow to systematize our evidence. This refers not only to the specialist, but also to the general practitioner and the pediatrist, especially in regard to different varieties of tonsilar affection. For instance, we may have a cervical gland deep behind the tonsils. I do not believe the average childrens' specialist keeps a record of the septic glands found in children's throats. If a septic gland were found in any other part of the body a record would be made of it and it would be removed. The tonsil noticed by the specialist is the tonsil that sticks away out into the throat, but other kinds may be just as dangerous. The crypts go down deep; and there the chief sepsis occurs, on account of the moderate amount of epithelium. By properly examining the cervical glands, one should be able to tell the pathology of the tonsils without looking at the throat. I always examine these glands before examining the throat. The pathology of the throat has in each instance, confirmed the diagnosis made by the size of the cervical glands. The tonsillar affection, if very definite, will make the tonsils hard. It depends upon the length of time the condition has existed, how hard they will be found to be. In proportion to their softness, the infection is likely to disappear; in proportion to their hardness. the prognosis is bad. Twenty per cent of tonsillar infections are of this variety, while eighty per cent are of the palatal tonsil. The latter tonsil is practically incapable of extirpation, and its extirpation should not be attempted without serious provocation. When I hear of extirpation of this tonsil, which is particularly liable to adenitis, I feel skeptical. Others claim to remove it, but I have never been able to do so. It extends three-quarters of an inch into the palate. When I attempted to remove the capsule, I got cervical sepsis, and even edema under the zygomatic arch. In the other cases, the capsule removed itself; but the latter kind, which include eighty per cent of the cases, are practically inoperable, without serious danger of causing cellutis of the neck of different forms. When the palatal tonsil extends to this depth it is better to clean it out and involute it. When we remove that variety, we go further and take the salpingeal folds, which also create a certain amount of adenitis cervicis. The adenoid region causes adenitis in the post cervical region. There are little dots, feeling like small buckshot.

As I have stated in the beginning, it is the rule to have this evidence of sepsis without looking at the tonsil; and if it were in any other part of the body, the surgeon or physician would notice it. Being, however, so common, it is practically ignored. I have noticed these glands go down in proportion to the betterment in the condition of the throat following operations; and I have noticed, in many cases, the after pathology of these glands in regard to the growth or disappearance of the pathological phenomena. It certainly is a very interesting subject. I think that in our reports we should give the amount of adenitis cervicis in proportion to the amount of tonsilitis; and I would urge upon the physician to take cognizance of the amount of sepsis in the cervical glands.

Dr. C. L. Richards: With reference to adenitis cervicis, do you find tuberculosis to be usually the cause?

Dr. Myles: In a series of cases on which general surgeons in New York City have operated for cervical glands. I have insisted that at the same operation I should dissect out all the lymphoid tissue in the throat. Every one of these patients is to-day in splendid health.

Dr. Richards: In other words, the glands were universally tubercular?

Dr. Myles: It was very difficult to tell, because we extirpated them so thoroughly. Men like Adler and other good pathologists are coming over to the idea that these cases are instances of direct infection through the lymphoid ring of the throat. One should involute these basic tonsils in the throat, especially, and cut them out; and when this is finished, there is a hole, but the capsule is left in. They develop like a tumor in the palate.

Dr. Packard: I had a case that seems instructive in this repect. The patent, a child previously healthy, had a sore throat last September. He had had no serious illness except whooping-cough. Following the attack of sore-throat, a large, hard, cervical gland developed on the right side. The child was brought to see me last January. He had a pair of big tonsils, which I took out. They were very adherent and very difficult to remove. Their removal had no effect on the swollen gland on the right side. In March, Dr. R. G. LeConte removed the gland by external operation and examined it microscopically. He found it tubercular. There was no other evidence of tuberculosis in the child. The tuberculin reaction has recently been tried, but I have not yet heard the result.

Dr. Richards: I have had some experience with this rheumatic condition. A woman with almost no tonsil has, two or three times a year, a severe systemic infection in the throat, complaining severely of pain along the adenoid region—or where the adenoid region would be, if she had any. There are probably some remnants of the glands and along the thickened pillars, showing the transference of the poison through the lymphatic ring. This patient has been operated on by the general surgeon for all sorts of complaints. A good many of these cases, which, perhaps, are handled by the general practitioner, have more of the source in the throat than we have yet appreciated; because some do not present much evidence in the throat in the intervals between the attacks, even on careful examination, by drawing the anterior and posterior pillars forward and lifting up the arch of the palate. Yet when the attack comes on, they have a severe systemic infection with its local point in the throat; and the only cure seems to be to remove in the interval every portion of tymphoid tissue that can be found.

With reference to the cervical gland, I do not know whether Dr. Myles understood my question. I wanted to know whether the enlarged lymphatic glands in children are not almost entirely tubercular. I have operated upon such glands, and have had them examined pathologically afterward. Sometimes tubercle bacilli are found, and sometimes not. In an association like this, composed of men that regard themselves laryngological surgeons, why should we advocate turning such cases over to the general surgeon? If we have to work in the nose and throat and remove the tonsils, we ought to be able to remove our own cervical glands. We are the only persons that can induce the family of the patient to have such a gland removed. I have been endeavoring to get my patients to let me clean out the cervical chain, as well as enucleate the tonsil.

Dr. Francke H. Bosworth: Mr. President:—In the first place, the importance of recognizing the fact that the lymphoid tissue of the pharynx is a source of infection cannot be overestimated. The pharynx is not a part of the air-passages, but of the food-passages; and it is not involved in acute "colds." An inflammation of the pharynx should be recognized as an infective disease.

When you come to the question of the mischievous action of the tonsil, I would say that when we remove a tonsil, we are taking out a large mass that the Lord did not put there, but the mother. Potin describes it as lymphatism that involves the lymphatic ring, and the lymphatics of the neck and other portions of the body. It is our duty to remove diseased lymphatics. The majority of children that come to throat specialists have enlarged lymphatics. These do not constitute a clinical condition that demands interference. If we remove the mechanical condition in the pharynx, destroying the focus that entangles the germs, we have done all we are called upon to do. Germs do not lodge there usually. It is only by the mechanical entrapping of bacteria that they burrow into the tissues and produce these infective diseases. It seems to me that our duty is not to dig out all the lymphatic tissue, but merely to remove the pockets, which are the source of the mischief. If we can get rid of them, there will probably be no further trouble, The Lord put lymphatics there for some good purpose, and that purpose should not be thwarted. This is assuming that the invaginated tonsil is not a condition that exists in the economy. Invagination is a diseased condition; but unless there are pockets, the condition is not one of disease.

The so-called palatal tonsil described by anatomists, I do not believe to be an organ of the normal body. It is only when there is invagination that it becomes a trap to catch the germs of disease.

In regard to removng all lymphatics, it does not seem to me that it is a clinical indication; for it is the mechanical indications that we have to remove. A large tonsil that projects into the throat—

a large, round mass, without any follicles—does no harm. We should not remove the lymphatics, but the mechanical conditions.

Dr. Cobb: I want to thank Dr. Bosworth for his remarks. It also seems to me very unlikely that we should have a tonsilar ring without any object. It is absurd to believe that we should have a mechanism for the sole purpose of absorbing bacteria in our throats. Therefore, the pathological retention by pockets or anything that tends to obstruct the flow from the tonsils will do more to cause trouble than will the tonsil or the lymphoid tissue. Is it not possible that the lymphoid tissue is a protector, and the glands in other localities are also for the purpose of protecting against micro-organism? They hold pathological material in the glands for some time, attempting to destroy it. Sometimes they succeed; but sometimes they are overcome, and the germs get into the general circulation. It seems to me that it is a mistake to think that one should obliterate apparently normal tissue, simply on the evidence that through it pathological organisms occasionally reach the circulation. It appears quite possible and more than likely that these get in, not on account of the presence of the ring, but in spite of it. If we were to inject one one-hundredth part of the bacteria present in acute tonsilitis into the circulation, the result would be septic fever. There is very little sepsis in acute tonsilitis. There is some for a day or two, and then it is relieved. Does not this mean that the tonsil has been able to take care of an enormous number of bacteria and fight against them, instead of serving as a sieve to admit them? If this enormous number of germs had reached the circulation, should we not have had a great deal more sepsis?

Dr. Mayer: I am very glad to see this subject brought up; as I recall that, within the year, Jacobi has published an article taking an entirely different standpoint from that which we have all accepted—that there is a direct infection beginning with the lymphatics of the throat. The standpoint of the speakers at that time was so different from what I had believed that I am glad to have an opportunity to hear the matter discussed. If Dr. Fitz has any observations of his own to present, we should be happy to know what his views are regarding infections at this particular point.

Dr. R. H. Fitz: The general practitioner, so far as the relation of the tonsil to the infection is concerned, is usually more interested in acute articular rheumatism than in any other disease. it seems that, whatever the tonsil may do in some infections, it does not do the same in all. The particular appearance of one organism, in which it differs from another, may allow of its passing through the tonsil. The remarks we have just heard were to the effect that in the tonsil we have a sufficient guard from certain abnormal infections. I do not know whether the result of extirpation of the tonsil has been determined with regard to its bearing upon cases of multiple arthritis. It seems a very interesting point for those with large experience to study. The infections that occurs after the removal of the tonsils should be investigated in relation to those occurring before the tonsils have been removed.

Dr. Myles: Dr. Richards asked me a question regarding tubercular glands of the neck. I did not wish to say that I advocate the removal of lymphatics when they are protective, but only when they are suppurating. In regard to having such operations done by the general surgeon, I would state that these patients were not brought to the general surgeon by me, but were brought to me by the general surgeon.

Dr. Bosworth: Twenty-seven years ago, in London, I made the assertion that from the practical point of view, there are no tonsils in a healthy throat. I venture the prediction that this statement will soon be accepted by all practitioners. I have been practicing forty years, and have come to the conclusion that the tonsil is placed there as a trap for disease. It is not the lymphatic body that invites the micro-organisms to enter the body; it entraps them and prevents systemic infection. There is no tonsil in the healthy throat; the tonsil described by anatomists is a disease-process. In studying its function, therefore, we are trying to determine the physiological function of a pathological lesion.

Discussion of Dr. Goodale's paper to be concluded.

Proceedings of the American Laryngological Association to be continued.

BOOK REVIEWS.

The Practitioner's Medical Dictionary. An Illustrated Dictionary of Medicine and Allied Subjects, Including all the Words and Phrases Generally used in Medicine, with Their Proper Pronunciation, Derivation, and Definition.

By GEORGE M. GOULD, A. M., M. D., author of "An Illustrated Dictionary of Medicine, Biology, and Allied Sciences," "The Student's Medical Dictionary," "30,000 Medical Words Pronounced and Defined," "Biographic Clinics," "The Meaning and Method of Life," "Borderland Studies," etc.; Editor of "American Medicine." With 388 Illustrations. Octavo; xvi + 1043 pages. Flexible Leather, Gilt Edges, Rounded Corners, $5.00; with Thumb Index, $6.00 net. P. Blakiston's Son & Co., Publishers, 1012 Walnut St., Philadelphia.

A reliable dictionary is as essential to every worker in medical literature as a good scalpel is to the surgeon. No one knows more of dictionary construction than Dr. Gould, for with his vast experiences both in literature and in dictionary making he is in a supreme position to know not only the necessities, but the luxuries of the practitioner and also of the litterateur.

This book is based on recent medical literature, contains among other new features, the terms of the Basle Anatomical Nomenclature, the Standards of Pharmaceutic preparations as authorized by the Eighth Decennial Revision of the United States Pharmacopeia, and has been made up in a form most suitable for ready reference, and especially well bound in flexible leather. G.

Diseases of the Nose and Throat.

By D. BRADEN KYLE, M. D., Professor of Laryngology and Rhinology, Jefferson Medical College, Philadelphia. Fourth Edition, Thoroughly Revised and Enlarged. Octavo volume of 725 pages, with 215 illustrations, 28 in colors. Philadelphia and London: W. B. Saunders Company, 1907. Cloth, $4.00 net; Half Morocco, $5.50 net.

The appearance of the 4th edition of Dr. D. Braden Kyle's standard work on Diseases of the Nose and Throat is certainly indicative of the popularity and constant demand for this excellent volume.

The new edition has been thoroughly revised; many new articles and chapters have been added; rhinological literature, both American and foreign, have been brought up to date, and the number of illustrations has been increased.

In the opinion of the reviewer it is often more difficult to revise an old edition than to present a new book, and in this task Dr. Kyle has been exceptionally successful.

The author maintains the position which he has outlined in previous editions, in that he considers each subject from the general standpoint in its relation to the specialty which he represents so well. G.

The Principles and Practice of Modern Otology.

By JOHN F. BARNHILL, M. D., Professor of Otology, Laryngology and Rhinology, Indiana University School of Medicine; and ERNEST DE W. WALES, B. S., M. D., Associate Professor of Otology, Laryngology and Rhinology, Indiana University School of Medicine. Octavo of 575 pages, with 305 original illustrations, many in colors. Philadelphia and London: W. B. Saunders Company, 1907. Cloth, $5.50 net; Half Morocco, $7.00 net.

In this age of multiplicity of text books, it is well to single out the objects and purposes for which each volume is produced. The authors of this volume have very honestly expressed their objects as follows:

1. To modernize the subject of Otology; 2. To correct certain traditional beliefs that have done much to hamper the progress of otologists in the past; 3. To advocate the fullest possible prophylaxis, or treatment, which has often been lost sight of because of the unusual activity of the surgical aspects of otology; 4. To emphasize the importance of a thorough examination and a definite diagnosis as a basis for rational treatment, since much of the success of otological practice depends largely on these issues; 5. To thoroughly illustrate the texts. Here the authors have succeeded exceptionally well, and we note many original illustrations, and the absence of the usual stereotyped cuts which have been reproduced from volume to volume.

We would frankly compliment both the authors and the publisher on the admirable way in which the objects for the preparation and production of this volume have been carried out, and the objects above referred to have been maintained. G.

Text-Book of Otology.

By Fr. Bezold, M. D., Professor of Otology at the University of Munich and Fr. Siebenmann, M. D., Professor of Otology at the University of Basle. Translated by J. Holinger, M. D., Chicago. Cloth. Pp. 315. Price, $3.50. Chicago: E. H. Colegrove Co., 1908.

Dr. J. Holinger has conferred an especial opportunity on American and English otologists by translating the work of the two great German masters in otology, Prof. Bezold, of Munich, and Prof. Siebenmann, of Basle.

It is a fact much to be deplored that many of our readers are unfortunate in not being thoroughly familiar with the modern languages other than their own, and because of this lack of accomplishment they are frequently unable to keep in touch with the literature and the original work which is so thoroughly produced on the other side of the Atlantic.

It is always an indication of literary and scientific value, and of original work, when the recorded results of active workers in science are translated into another tongue.

The many years of diligent research which Prof. Siebenmann has made in developing the pathology of oto-sclerosis and rarefaction of the labyrinth, and the extensive experiments and tests which have been made by Prof. Bezold with his carefully constructed series of tuning-forks, and the differential diagnoses which have been made possible as the result of these deductions, are of inestimable value to every worker in otology. When we add to this the immense clinical resources and experiences of these veteran teachers, and find much of this subject matter contained in a little more than 300 pages of text, we have a rich store-house of information and much food for thought. The laborious work of the translator should carry with it the gratification that he has placed additional resources at close hand to his English reading confreres. G.

Erratum: The foot-note to Dr. W. Sohier Bryant's article, "The Management of Suppuration of the Middle Ear, Etc.," on page 193 of the March number should be: Read before the Thirteenth Annual Meeting of the American Laryngological, Rhinological and Otological Society, May 30-June 1, 1907.

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

VACCINE THERAPY IN SOME SUPPURATIONS OF THE NOSE AND EAR; ALSO TECHNIC FOR DETERMINING OPSONIC INDICES.*

BY JOSEPH C. BECK, M.D., CHICAGO.

THE TECHNIC OF DETERMINING OPSONIC INDICES.

The facts and theories upon which opsonic treatment is based are as follows:

1. Bacteria infecting the body are attacked by leucocytes which ingest them.

2. The number of bacteria which can be ingested is of varying quantity.

3. The number of bacteria which can be ingested depends upon their preparation by substances present in the plasma of the blood known as opsonins.

The exact nature of opsonins is not known, but it is known that they are not identical with the agglutinins, antitoxins, etc., which are also found in the plasma. Their action is not on the leucocytes, but on the bacteria which, as stated, they prepare for ingestion. Opsonins are present in normal blood as well as in the blood of infected individuals. The opsonic strength of normal blood is practically constant, but varies slightly with the individual, and general health, nutrition, etc.

The opsonic strength of an infected individual is lower than that of a normal individual, consequently his blood can prepare fewer bacteria and fewer will be ingested by the leucocytes. The relation between the number of bacteria ingested by the leucocytes of the infected person to the number of bacteria ingested by the leucocytes of a healthy individual, gives us a value which we call "the opsonic index." For instance, if ten bacteria are ingested on the average by the leucocytes of a healthy person, and five of the same bacteria by the leucocytes from an infected person, the opsonic index of the latter would be .5.

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*Read before the Middle Section of the American Laryngological, Rhinological and Otological Society, Indianapolis, Feb. 22, 1908.

The opsonic index of an infected person may be increased by injecting into him killed cultures of his infecting organisms. For instance, if an infection is due to the staphylococcus albus, some of these particular germs are taken, grown on suitable culture media, and when sufficient quantity has been obtained, the culture is washed off with .85 per cent sodium chloride solution, to which a little carbolic acid has been added. The mixture, well shaken, is standardized to contain 300,000,000 cocci to the cubic cm., which represents one hypodermic dose. It is important to inject cultures made from the particular infecting organisms, because it is well known that even such well known organisms as the staphylococcus albus are subject to greater variation in virulence. Furthermore, this prevents errors in the diagnosis of the infecting germs.

I. METHOD OF DETERMINING OPSONIC INDICES.

In a small test-tube, place about two cubic cm. of a solution containing 1½ per cent of sodium citrate, and .85 per cent sodium chloride. Clean the finger with soap and water, followed by alcohol; prick the finger, and allow fifteen drops of blood to flow into the solution in the test-tube, mixing well. The sodium citrate prevents coagulation of the blood. The test-tube is now taken to the centrifuge and centrifuged until all the solid particles of the blood are thrown down. The red blood corpuscles being the heavier, will form the lower layer, the leucocytes appearing as delicate, grayish film (known as "cream") on the surface of the reds. The supernated liquid has dissolved in it the plasma of the blood and is withdrawn by means of a delicate pipette, care being taken not to disturb the cream. The test-tube is then filled with .85 per cent sodium chloride solution, the corpuscles well shaken up, and the mixture again centrifuged. The corpuscles will then arrange themselves as before, and after withdrawing the supernated liquid, we will have freed them from the original plasma and the sodium citrate that was previously added. By means of special tubes, known as capsules, a quantity of blood is collected from the patient (capsule half-filled). Capsules of blood are similarly collected from several healthy individuals (two or three). The capsules are placed in the incubator at 37° C. for about five minutes, when the blood will be found to have coagulated. The capsules are then centrifuged, the clot being thrown down, leaving the clear serum above. Meanwhile a suspension of the particular bacteria has been made by taking a loopful from the culture and mixing thoroughly with a quantity of .85 per cent salt solution, the amount of the solution being such that the mixture will be turbid, the turbidity to be judged only by experience.

We now have prepared: a. The cream consisting of washed leucocytes; b. a suspension of the infecting bacteria; c. serum from patients; d. serum from several normal individuals.

We now take a pipette with a long capillary stem. At a distance of about 5 millimeters from its tip, we make a mark with a blue pencil. We now draw from the cream sufficient to fill the stem up to the blue pencil mark. Then we remove the pipette from the cream, drawing the volume a little ways up to the stem so as to leave an air space. Then dip the same pipette into the suspension of bacteria of which we draw up an equal quantity. We leave another air space and draw up an equal quantity of serum from the patients' capsule. We now blow the contents of the pipette upon a glass plate and mix thoroughly by drawing up and blowing out several times. After mixing, the mixture is drawn well up into the stem of the pipette, the tip of the pipette sealed in a flame, the pipette marked on its bulb for identification and laid aside. We now take equal quantities of the sera from the capsules of blood collected from the normal individuals and mix them together in a little test-tube. This mixed serum is called "the pool." The object of mixing several sera rather than relying on one serum is to overcome fluctuations which are present in normal sera (fluctuating opsonic strength.) Another long-stemmed pipette is now taken, a distance marked off from its point as before, and equal quantities of cream, bacterial suspension, and pool serum taken and mixed, drawn up into the pipette, the end of the pipette sealed, its bulb marked for indentification, and laid aside.

It will be noticed that these two pipettes vary only in that one contains patient's serum in the mixture, while the other is made up with pool serum. The two pipettes are now taken, placed in the incubator at 37° C. for fifteen minutes. They are then removed from the incubator, the contents of each is separately blown on a glass plate, drawn back and forth several times to insure mixture (this second mixing is required because the corpuscles tend to settle during incubation), and now a drop of the mixture is blown onto the end of a perfectly clean glass microscopical slide, and the drop spreads evenly over the slide. At least three slides (two to be held in reserve for accidents) should be made from each pipette. The slides are now stained with Nocht's stain and examined with the microscope. The number of bacteria in each of fifty leucocytes is counted on each side. As before stated, the relation between the number of bacteria ingested by the leucocytes on the patient's slides compared with the number ingested by leucocytes obtained from the control slides, gives us the opsonic index. As will be noticed, the serum was the only variable factor in the preparation of these slides, therefore the variation in the number of bacteria ingested must be due to this difference of sera, and the substance in the sera which is responsible for this variation is "opsonin."

II. PREPARATION OF VACCINE.

A culture of the specific germs is washed off with salt solution and carbolic acid as before stated, standardized, placed in homeopathic phial (number for staphylococci being 300,000,000, other organisms requiring a strength of from 50,000,000 up) subjected to a temperature of 60° C. for a half to one hour in order to kill the organisms, a higher temperature to be avoided so as not to interfere with the chemical action of the bacterial ferments.

A control culture is made from the vaccine, and in certain cases also guinea pig inoculations to insure sterility of the vaccine, especially the absence of tetanus must be insured.

REPORT OF CASES.

The total number of cases that I have treated by this method are eleven, which are as follows:

2 Unilateral sinusitis of the staphylococcus variety of infection, of a chronic type.

1 Polysinusitis, chronic, of a staphylococcus aurius, pseudo-diphtheria bacillus.

1 Chronic antral infection, unilateral of dental origin, staphylococcus infection.

2 Subacute unilateral sinusitis (most probably confined to the frontal sinus.) Staphyloccus pyogenes aureus.

2 Chronic purulent otitis media of a double infection; viz., staphylococcus and pneumococcus (bilateral).

1 Chronic purulent otitis, radical mastoid, Friedlander bacillus infection.

1 Chronic purulent otitis, unilateral, ossiculectomy, diphtheria infection.

1 Acute otitis media purulenta bilateralis diphtheria-like bacillus infection, following a violent grip attack.

All these cases had, previously to the vaccination treatment (autogonous), the usual accepted method of treatment without the desired results. All of them were subjected to the opsonic index which was lower than the normal; one as low as 0.3 and the nearest to the normal was 0.76. In all but one case, and that was the chronic bilateral sinus infection in which more than one index was taken, I depended almost exclusively on the clinical manifestations as an index and used the average time of ten days between the times of vaccination. Complete records were kept on the observations such as reaction and other symptoms and will be published in detail in a subsequent paper. Suffice it to say at this time that without exception there is a distinct improvement and some of the cases are cured, although not long enough time has elapsed in the chronic cases to be absolutely certain. My purpose in bringing this subject before you is not to come with any positive conclusions because in the first place it requires a great number of cases of various pathological conditions and a much longer time to observe before one can make positive statements, but, to encourage if I can, some of you to take up this line of work if you are not already doing it, and in a symposium, report our results. So far as complications or accidents are concerned in this treatment, I must say that not in one case was there a single bad result and only one that gave me any thought and anxiety, and that was the following:

In the case of subacute unilateral sinus disease of staphyloccus pyogenous aureus infection, at the second injection into his left arm, there followed what clinically one would diagnose as an erysipelas with marked infiltration from the point of innoculation above the elbow, down to the finger tips, but absolutely no general symptoms. The patient felt as well as he ever did, and there was no infection of the axillary glands. Most of the cases showed slight general disturbances for from an hour to four hours after the vaccination, such as nausea, malaise and slight headache, and occasionally a slight rise of temperature.

The specific technic of vaccination is as follows: Scrub up thoroughly the part where the injection is made, either the arm or interscapular region, and under strictly aseptic precautions, draw up into a hypodermic syringe the dose prescribed, usually one cubic centimeter of the vaccine, and inject subcutaneously, seal up the puncture with collodion. As said above, about ten days are allowed to elapse, when a second vaccination is made and so often repeated in those intervals until the patient is cured. If one should observe that a patient reacts badly and becomes markedly depressed after the injection, it is necessary to prolong the interval.

In conclusion, I wish to say that at the present time I have the following cases under treatment, but not sufficient length of time has elapsed for me to even report any partial results. Three cases of chronic nasopharyngitis, all staphylococcus infection (mild).

Two cases chronic tubercular laryngitis (ulcerated).

Four chronic purulent otitis media bilateral, in tubercular individuals, in which a positive ophthalmic reaction was obtained.

Two cases of atrophic rhinitis in tubercular subjects, one in non-tubercular subject.

All these tubercular patients are treated by tuberculin injections instead of the autovaccine.

The laboratory work of determining opsonic indices and making the vaccines are at present done for me by the *Columbus Medical Laboratory* and the *Chicago Laboratory.*

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A CASE OF LABYRINTHINE DEAFNESS WITH "TONE ISLAND."*

BY GEO. E. SHAMBAUGH, M. D., CHICAGO.

Mr. W., 25 years old, a student. No history of deafness in either his father's or mother's family, is obtainable. The patient has one brother a few years older than himself, who, for a number of years has suffered from ear trouble similar to his own. An examination of this man's hearing gave the reactions characteristic of partial loss of hearing due to involvement of the nerve apparatus.

The patient had no serious illness as a child excepting measles, and perhaps pertussis. He has had no previous ear trouble. He first began to detect defective hearing while he was attending the high school at the age of 19. At this time he did not suffer from tinnitus aurium.

In July and August, 1906, he had typhoid fever. About two months after getting out of bed he began to detect tinnitus aurium in the right ear. This has remained constant ever since. Later tinnitus also began to be noticed in the left ear, where it has appeared to be intermittent. The character of the tinnitus in both ears is that of a high-pitched cricket-like sound.

There has been no dizziness nor other symptoms referable to the ears.

The membrana tympani in both ears is normal.

The functional examination gives the following: *Whispered voice.* Right ear "82" heard at two inches from ear, "66" not heard at all. Left ear "18" heard at four inches from ear, "66" is not heard. In the *Weber test* the "A" fork is indistinctly lateralized in the left ear, but appears to be heard in both ears. In the *Schwabach test* the duration of bone conduction for the "A" fork is normal. The *Rinné reaction* for the "a" fork is positive in both ears.

In testing the several parts of the scale by means of the Bezold-Edelmann continuous series of tuning forks the following conditions were found: In the right ear the patient heard all tones of the scale up to f^3. From this tone to the upper limit there is complete loss of hearing. In the left ear he hears all tones from the lowest fork, 16 d. v. per second up to f^4. From f^4 to a^4 there is in this ear complete defect in hearing. From a^4 to e^5 he hears all the tones. Above e^5 to the upper limit there is again a complete defect in the hearing. We have in the left ear from a^4 to e^5 an example of a so-called "island of hearing," or "tone island," also an exampie of a circumscribed defect in the midst of the scale from f^4 to a^4.

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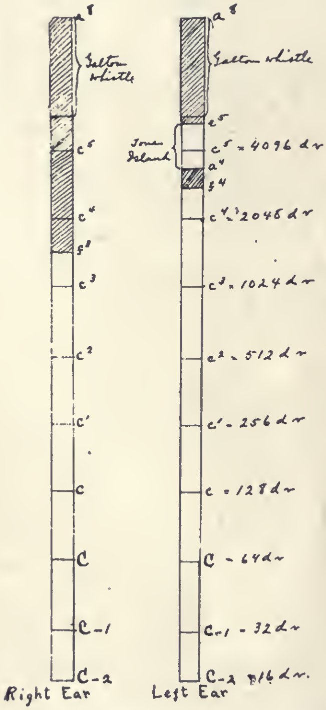
* Read pefore the Chicago Laryngological nnd Otological Society, Nov. 12, 1907.

Circumscribed defects in the scale are by no means uncommon. A loss of hearing for the tones at the lower end of the scale is associated with almost every case of middle ear disease, and is caused apparently by a more or less rigidity of the sound conducting mechanism, that is of the membrana tympani, and the chain of ossicles, but especially upon a fixation in the oval window of the stapes which must be looked upon as the key to the sound conducting mechanism.



Defects circumscribed to the upper end of the scale are also quite common. Such defects, as well as circumscribed defects in the middle of the scale and the existence of islands of hearing as found in the left ear of this case must be looked upon as the result of disease located in the cochlea. The possibility that such circumscribed defects in the scale are due to disease in the brain centers of the cortex seems highly improbable. The reason for which we need not discuss here.

The great interest which a case such as this possesses is the light which it throws on the problem of tone perception. The faculty which the organ of hearing possesses of recognizing the correct pitch of tones, and at the same time of analyzing into their several elements the complex tones which impinge on the ear at one time, lead Helmholtz to construct his resonator theory of tone perception to explain these phenomena. One of the fundamental hypotheses of the Helmholtz theory is that groups of end-organs in the several parts of the cochlea have to do each with the perception of particular tones, the lower tones being taken up by the hair cells located near the apex of the cochlea, the higher tones by those in the basal coil. The second fundamental hypothesis of his theory is that there exists in the cochlea a mechanism which acts as a physical resonator, responding in one part to tones of a certain pitch, and in another part to tones of a different pitch. It is the mechanical action of these physical resonators responding to tones of different pitch in the several parts of the cochlear tube that brings stimulation to this or that group of hair cells, and leads to the perception of this or that particular tone.

Objections to the Helmholtz theory have arisen, and since his time a number of new theories have been suggested to explain the interesting phenomena of hearing. However, with the knowledge which we have of the various phenomena associated with tone perception, physiologists are, for the most part, convinced that we can hardly escape accepting the theory that a resonator in some form exists in the cochlea. On the other hand, the clinical phenomenon presented by these cases where "tone islands" are found is one of the strongest proofs of the hypothesis that perception for the several tones takes place in separate and distinct parts of the cochlear tube.

I believe I have been able to demonstrate that the particular structure in the cochlea which Helmholtz fixed upon as the mechanical resonator, viz., the radiating fibers of the basilar membrane, is not the vibrating structure which it was supposed to be by Helmholtz. This discovery does not, however, overthrow the fundamental principles of the resonator theory as laid down by Helmholtz. I have attempted to show that the membrana tectoria, and not the basilar membrane, is the logical structure for stimulating the hair cells. This is the structure which apparently fills the role of physical resonator by responding in its various parts to tones of different pitch. I have shown that the tectorial membrane varies enormously in size from one end of the cochlea to the other. This variation in size, together with its fibrillar structure, are characteristics which suggest the probable physical basis which render it possible for this structure to act the part of physical resonator by responding in one part to impulses of a certain pitch, and in another part to impulses of a different pitch.[1]

The human ear is capable of hearing tones at least as low as 16 d. v. per second, and tones as high as 55000 d. v. per second. With the conception that the perception of the lowest tones takes place at the apex of the cochlea, and that the tones higher and higher in the scale are taken up successively by groups of hair cells located nearer and nearer the base of the cochlea we can readily account for the phenomena as presented by this case, where we find the circumscribed preservation of hearing for a certain part of the scale in the midst of a more or less extensive complete destruction of hearing for neighboring tones. We have simply to imagine that we have spread out from one end of the cochlea to the other a mechanism not unlike a piano-forte, each particular part responding to a tone of a particular pitch. A disease process invading the cochlea, such as the formation of a blood clot, the invasion of pus, as in cerebro-spinal meningitis, or from an otitis media, or a nerve degeneration, may destroy the end organs over a certain part of the cochlea, and leave the remainder untouched. The result would be exactly what we have in this case, the preservation of so-called "tone islands."

Just what the process is in this particular case that has invaded the cochlea we can only surmise. The fact that the process has been an insidious one, and began before the age of 20, when taken with the fact that a brother has developed the same type of deafness coming on in exactly the same way suggests the possibility that this may be due to the condition known as otosclerosis. The spongifying of the capsule involving the basal coil in both cases, but without extending to the footplate of the stapes.

100 State street.

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[1] A Restudy of the Minute Anatomy of Structures in the Cochlea with Conclusions Bearing on the Solution of the Problem of Tone Perception. *Am. Jour. of A t.*, Vol. VII, No. 2 P. 245-257, Aug., 1907.

OBSERVATIONS ON THE TEMPORAL BONE.*

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The study of the surgical anatomy of the temporal bone is always interesting. There has appeared from time to time much literature on this subject, with many recorded observations, notwithstanding which there still exists considerable diversity of opinion not only as to the exact status of some of the more important points in the anatomy of this bone, but also as to the surgery of the mastoid process.

The constancy of certain familiar landmarks, the size and position of the several parts of the temporal bone and their relation to neighboring organs of importance are to my mind of sufficient interest to warrant the report of my findings from the examination of material upon which the work of this paper is based.

I. MATERIAL.

The material upon which the observations quoted in this paper are based consisted in the examination on the cadaver of 463 adult temporal bones. Of this number 249 were males and 214 females. In age they ranged from 19 to 79 years.

II. VARIATION OF CONTOUR.

The study of the comparison of the fully developed mastoid process in different adult individuals presents such variation in contour and structure as to make it impossible to establish a definite description as to the exact exterior and interior of a mastoid process. There exists no bone in the human body which presents so many deviations, both externally and internally, as does the normal mastoid process of the temporal bone.

Outwardly the mastoid process may be flattened or round in contour. The tip may be vertical, oblique or curved. The outer surface may be smooth and hard, or it may present irregularities and numerous openings for the passage of blood vessels. The cortex may be exceedingly thin, not more than .5 mm. in thickness, or it may be as thick as 10 mm. Certain limited areas may be thin and the surrounding areas thick. The same multiplicity of variations as noted in the examination of the exterior is found in the examination of the interior.

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* Read before the Thirteenth Annual Meeting of the American Laryngological, Rhinological and Otological Society, New York City, May 30, 31, and June 1, 1907.

Apart from the variations due to the development of the bone from infancy to adolescence, certain other conditions no doubt influence the character of the contour of the mastoid process and its interior, and while it cannot be said with any degree of certainty as to what will be the character of a mastoid process from its external appearance, yet it can with reasonable assurance be assumed that the mastoid process of a well developed and muscular man will be of large size, with prominent surface markings, and a spacious interior.

The dolichocephalic skull will present a larger mastoid process than a brachycephalic skull, a male a larger process than a female, and likewise a muscular man a larger and better developed mastoid process than a non-muscular man.

Since, therefore, we have large broad processes and small narrow ones, we are justified in supposing that when the process is large the essential structures contained within it will be separated from each other much more than when the process is small, when the structures must necessarily be in closer apposition in the more confined space.

The arrangement of the cellular tissue of the mastoid process is also subject to vagaries of structure.

III. SYMMETRY.

The symmetry of the two mastoid processes in an individual is at times important from a surgical point of view. In the examination of 119 crania for determining asymmetry of these processes, I found the mastoids decidedly asymmetrical 9 times, or 7.5 per cent of cases examined. Blake,[1] in an examination of 300 crania with reference to asymmetry found that 10, or 3 1-3 per cent, had markedly asymmetric mastoid processes.

In a general way, it may be said that the mastoid process is conoidal in form, with a direction downward and slightly forward. Contrary to the claims made in most text-books that the anterior wall is distinctly vertical, the anterior wall may be vertical or may incline obliquely forward, or the tip may be curved in a forward direction. My observations showed the anterior wall vertical in 69 per cent of cases examined, inclined obliquely forward in 26 per cent, and curved forward in 5 per cent.

The posterior border inclines downward and forward at an angle of about 45 degrees.

IV. SURGICAL LANDMARKS.

On the external surface of the mastoid process are noticed several landmarks of surgical importance, the suprameatal spine or spine of Henle, the suprameatal or supramastoid fossa, the remains of the squamo-mastoid suture and the mastoid foramen.

Of the three portions of the temporal bone, the squamous and petrous portions enter into the formation of the mastoid process; the squamous above and in front, and the petrous behind and below. The junction of these two parts form the squamo-mastoid suture. This suture situated on the outer aspect of the mastoid process runs from the parietal notch downward and forward to a point behind and below the external auditory meatus, external to the styloid process.

I have found it present as an open suture 9 times, and the remains of the suture evidenced 74 times, or 16 per cent.

This squamo-mastoid suture belongs more properly to the infant bone, though frequently it persists until puberty and in some cases remains permanently unossified. In adult life usually some traces of it remain and it is recognized during operation by the firm adherence to it of the overlying periosteum, which, when elevated, leaves a white line of shreds upon the surface of the bone. MacEwen[2] reports finding the suture open, in adults, 6 times during operation. (I observed this condition twice on adults, during operation.)

The suprameatal spine of Henle from the reliance placed upon it by many otologists as an infallible guide when operating, makes it one of the most important landmarks when present.

The spine varying considerably in size and prominence has nearly always the same relative position. It is a more or less prominent projection of bone situated above and behind the posterior-superior quadrant of the external auditory meatus, curved concentrically to the circumference of the meatus, with its upper portion slightly anterior to the lower portion. In size, it may be large or small. It may project prominently, or it may be flattened in appearance, or it may be entirely absent, or so slightly developed as to be overlooked, and can only be recognized by an experienced eye or felt by the finger. Usually its development is in ratio to the development of the balance of the surface markings of the temporal bone.

It is not constant. This differs from the views formerly held by most otologists, but at present there still exists differences of opinion as to just how often its absence may be noted. Yearsley[3] in the examination of 2,000 temporal bones found the spine absent 160 times, or 8 per cent. In addition, he found the spine very poorly marked in 12.57 per cent, being recognized only by the trained eye and finger. Broca[4] states that Kiesselbach noted its absence 18 times in 100 temporal bones which he examined; Schultze, 11 times in 120, and Lenoir, once in 200. My results of the examination of 463 temporal bones gives it absent 56 times, or 12 per cent. It was barely demonstrable in 41 other specimens.

When present, the suprameatal spine is a valuable landmark, and can be depended upon to furnish an excellent guide for entering the mastoid antrum, but, since the observations given above show its absence 246 times in 2,883 cases, or 8.5 per cent, too much stress must not be placed upon this as a landmark when operating.

The relation of the spine to the floor of the middle cerebral fossa showed the average distance between its upper part and the floor to be 6 mm. In one instance the floor was as low as the spine. Randall,[5] in the examination of 1,000 skulls, found it as low as the spine in but 5 cases.

Lying immediately behind the suprameatal spine is a depression called the suprameatal fossa. This landmark is more constant than the spine, therefore more useful as a guide. It represents the adult condition of the spongy spot seen in the infant, up to the second year of life. It is the external boundary of the antrum. In the infant its position varies with the position of the antrum, but in the adult its position is constant.

It may be a large excavated depression triangular or crescentric in shape, or it may be a mere chink or slit, or it presents as several large vascular foramina or many small ones. Yearsley[3] reports the finding of this fossa in every specimen of the 2,000 temporal bones which he examined. The results of my observations showed the absence of a fossa 36 times, or 7.7 per cent, of the specimens examined. However, in each of the 36 bones which failed to show a suprameatal fossa there were to be noticed two or more small foramina situated immediately behind the spine where the fossa should have been.

The result of my not considering these foramina as fossæ will no doubt account for the difference in the findings of Yearsley and myself.

In some cases where large foramina were present, the mucous membrane lining the underlying cells was in direct contact with the overlying periosteum which was evidenced by the adhesion between them. In one instance a foramen of unusual size was noted. It lead directly to the mastoid antrum. It was ovoid in shape measuring 4 mm. in its long diameter and 3 mm. in its short diameter.

The mastoid foramen is the opening on the cortex through which passes the mastoid emissary vein entering the lateral sinus at its descending or sigmoid portion. This opening may be single or double. It may be small, giving exit to a vessel of minute size, or it may be large so that the vessel emerging from it may be a sinus carrying all the blood to the external jugular vein. The bony opening may lead directly through the cortex to the sinus groove, or it may run between the outer and inner tables for a distance of as much as 15 mm. When this latter condition is present the outer opening is placed correspondingly far back. The position of the mastoid foramen varies in both a horizontal and vertical plane. Its usual location is 30 mm. behind the external meatus, and 30 mm. above the inferior end of the mastoid tip.

The linea temporalis, or temporal or supramastoid ridge, is a backward and upward prolongation of the posterior root of the zygoma. It is more or less prominent in different subjects, but it is always appreciable even in the child. Its position is almost invariably a little below the floor of the middle cerebral fossa, though in the examinations which I made to determine this I found the floor of the fossa below this line 6 times in 463 observations. This condition occurred in brachycephalic skulls.

On the inner side of the mastoid tip is the incisura mastoidea or digastric fossa, for the attachment of the digastric muscle. This fossa may be shallow or deep and occasionally its upper part is dehiscent. The absence of the superior wall was noted by me 3 times.

V. CELLULAR STRUCTURE.

The cellular structure of the mastoid process differs as to the number, size and character of the cells. According to the general character of the cells, a mastoid process may be called pneumatic, diploïc, mixed or eburnated. According to Zuckerkandel,[6] in 36.8 per cent of the cases examined by him, the mastoid consisted, from its upper to its lower boundary, of larger or smaller pneumatic cells; in 43.2 per cent it was formed, chiefly in its lower and posterior portion, of diploic and osseous substances; while the anterior-superior part contained pneumatic cells; in 20 per cent the mastoid was wholly made up of diploic, less frequently of sclerotic tissue.

The results of my observations show the purely pneumatic type of mastoid process to predominate, there being 44.2 per cent; the mixed variety, diploic below the pneumatic above, being 37.1 per cent; and the diploic type 1.86 per cent. It will be noted that in these figures no reference has been made to sclerosed processes, for the reason that this condition is undoubtedly always pathological and where a process was sclerotic the observation was not recorded. Randall[5] states that he does not believe any mastoid process to consist of purely pneumatic spaces.

The cellular structure is arranged as follows: It is divided into two parts; the mastoid antrum and the surrounding cells, all of which communicate with the antrum.

The antrum is the most important of the air spaces in the mastoid process. It is constant in its presence and nearly always so in its position. It may be large or small, according to the size of the mastoid process, or it may be diminished in size by reason of osteosclerosis.

I have always found it constant, notwithstanding the claim of some observers of their inability to find it. Whiting[7] has never failed to note it in over 800 cases.

The antrum does not contain compact bony walls, they being cellular in character. The size, while uniform, may be influenced by the nature of the mastoid structure. When the surrounding bone is pneumatic the antrum is usually large, but when the surrounding bone is diploic or dense the antrum is apt to be smaller.

The average height of the antrum was found to be from 12 to 15 mm., its width about 7 mm., and its breadth 8 to 10 mm.

The roof or tegmen antri is a thin plate of bone about 1 mm. in thickness, situated externally to the prominence formed by the superior semicircular canal, and is from 3 to 6 mm. higher on a horizontal plane than the upper margin of the external bony canal. It is continuous with the tegmen covering the tympanum and aditus and separates the antrum from the middle cerebral fossa. It frequently contains numerous foramina for the passage of small blood vessels. At times it has a distinctly cribiform appearance. It may be wholly or partially absorbed in old age. Burkner, as quoted by Politzer,[8] observed a dehiscence in the tegmen 167 times in a study of 765 cases. I have noted this condition 21 times.

The anterior wall may be thin, with an occasional dehiscence at its superior part so that the aditus in its vertical diameter may be as large as that of the antrum. When this does occur the facial nerve lies uncovered with bone, where the nerve turns to descend in its vertical course. This condition occurred twice in my observations.

The anterior wall separates the mastoid antrum from the bony portion of the external auditory meatus.

The posterior wall is seldom a wall, but rather a set of cells lying between it and the bony covering of the lateral sinus. These cells, which are frequently of large size, have been called by some authors the accessory antrum, but they are in reality the posterior superior cells.

The outer wall is formed by the descending plate of the squamous portion of the temporal bone. This wall may be as thin as 5 mm. or as thick as 20 mm. The average depth of the antrum from the surface of the bone is from 12 to 15 mm.

The depth differs from an age point as well as in different individuals of the same age.

The importance of the depth of the antrum lies in determining just how far one may enter with safety when operating upon the mastoid, in an attempt to reach the mastoid antrum.

Observers differ as to what is considered a safe distance to enter when attempting to reach this cavity. Politzer[8] gives his limit of safety from 5 to 6 mm., while Schwartze[9] places his at 25 mm. The distance of the outermost part of the mastoid antrum to the external surface of the mastoid process is a much mooted point. Many observations have been made along this line with a resultant difference of opinion. (It is an exceedingly important question, since an operator feels the necessity of an approximate idea as to the depth of the antrum and to what distance he can chisel without overstepping the limit of safety.)

For the proper estimation of the depth of the antrum, some fixed and definite point should be selected from which measurement should be taken. For this purpose the base of the supra-meatal spine has been generally accepted as a proper point.

I found, in my examination, that the thickness of the cortex from the outermost part of the antrum to the base of the supra-meatal spine was as follows:

Depth in mm.	Number of bones.
5	2
6	5
7	11
8	16
9	26
10	39
11	43
12	57
13	64
14	59
15	42
16	34
17	23
18	16
19	12
20	7
21	4
22	2
23	1
	463

It will be noted from these figures that the thickness of bone varies from 5 mm. to 23 mm., and that the average distance was 13.1 mm. Kerrison,[10] in a study of 30 temporal bones, measured the thickness of osseous tissue separating the antrum from the cortex and found that from the spine of Henle the depth varied from 6 mm. to 15 mm., with an average depth of 10.9 mm.

The character of this intervening osseous tissue may be dense, densely cellular or coarsely cellular. It was found to be dense in 251 bones, densely cellular in 8, and coarsely cellular in 124.

During the examination to determine the depth of the antrum, measurements were also made of the posterior-superior bony canal wall for the purpose of noting the relation of the depth of the antrum, to the length of the bony wall. The following measurements were taken:

Depth in mm.	Number of specimens.
9	2
10	7
11	18
12	31
13	50
14	56
15	69
16	73
17	54
18	36
19	27
20	16
21	10
22	8
23	4
24	2
	463

The average length of the bony canal was found to be 15.6 mm. In no specimen was the depth of the antrum greater than the length of the bony wall.

The cells in the mastoid process can for the purpose of convenience be designated by names according to the part of the temporal bone in which they are situated. We may have, therefore, squamous cells, zygomatic cells, tip cells, posterior tip cells, posterior superior cells and internal petrous cells.

Many authors have classified these cells into mastoid cells, petrous cells, squamous cells and zygomatic cells. The mastoid cells include those lying below a horizontal line passing through the center of the external auditory meatus. The petrous cells include those cells which occupy the base of the petrous portion of the temporal bone and are situated above a horizontal line dividing the external auditory meatus at its center. Behind they extend to the lateral sinus, anteriorly they are limited by the premastoid lamina. The squamous cells are situated in the part of the temporal bone which contributes to the formation of the posterior wall of the external auditory meatus. The zygomatic cells are usually included under the name of squamous cells and are to be found in contact with the meatus and bordering it, being prolonged occasionally above the meatus and in front of it into the root of the zygoma above the articulation of the jaw.

It has been my practice to designate these cells only as squamous cells which lie between the outer and inner tables of the squamous portion of the temporal bone. The tip cells, as their name indicates, are found in the tip of the mastoid process. These are usually the largest of the pneumatic cells. At times a single cell will occupy the entire tip. The posterior tip cells lie along the posterior border of the tip behind the lateral sinus. They, too, are frequently of large size. Their removal always exposes the digastric muscle. A set of cells lying between the antrum and the knee of the sinus have been called the posterior superior cells. The internal petrous or deep petrous cells are seldom large but occupy that part of the mastoid process between the antrum and the tip cells, internal to the incisura mastoidea. The zygomatic cells are those lying above and in front of the meatus beneath the ridge at the posterior root of the zygoma, above the articulation of the jaw.

The aditus ad antrum is the connecting channel or canal which joins the antrum to the tympanum. It has an average length of from 3 to 5 mm., is from 3 to 4 mm. high, and is about 3 or 4 mm. deep.

The direction of the aditus changes from child-life to adult-life according to the position of the antrum. Its position is almost horizontal, placed directly opposite to the tympanic orifice of the Eustachian tube, but on a higher level. On the outer wall there is more or less cellular structure. Its upper wall or roof is the tegmen of the aditus continuous in front with the tympanic tegmen and in back with the tegmen of the antrum. This thin plate of bone is, as in the case of the tegmen of the antrum or tympanum occasionally dehiscent. Its anterior end opens on the horizontal portion of the Fallopian canal. The external or horizontal semi-circular canal projects from its inner wall. Cells are frequently seen on the floor and inner wall.

The middle ear or tympanum is a small irregular air chamber situated in the petrous portion of the temporal bone. It is interposed between the external auditory meatus and internal ear. Its long axis is antero-posterior and measures from 12 to 13 mm. Its depth 2 to 4 mm., being narrower at the center of the drum. Its vertical diameter is about 13 to 14 mm., which includes the attic.

The attic, or, more properly, the recessus epitympanicus, is the highest portion of the tympanic cavity. It contains the head of the malleus and the body of the incus. It leads into the antrum by means of the aditus. The roof or tegmen tympani is a thin plate of bone continuous with the tegmen of the aditus. It separates the tympanum from the cranial cavity. In children under one year of age there is present the remains of the petro-squamosal suture. This suture may be present, in the adult, in its entirety, or remains of it recognized. When this suture exists the mucous membrane lining the tympanum is in direct contact with the dura mater. This suture was present in 12 of the ears which I examined. Cheatle[11] noted this suture 21 times in 210 temporal bones. Quite frequently a bony ridge can be noticed extending antero-posteriorly. This marks the position of the former suture.

The floor of the tympanum is also called recessus hypotympanicus. This bony plate is of variable thickness and separates the tympanic cavity from the jugular fossa. Normally there is a small foramen in the floor for the passage of a branch of the pneumogastric nerve. The floor may be partially or wholly dehiscent and when this does exist the dome of the jugular bulb presents in the tympanic cavity. This dehiscence is of very frequent occurrence in children and probably occurs in adults with much more frequency than is ordinarily supposed. I have noted this dehiscence in the adult 29 times, being complete 14 times. Koerner,[12] in an examination of 449 cases found a dehiscence in the floor of the tympanum 30 times. Gruber[13] reports the jugular bulb cut 5 times during paracentesis due to a dehiscence in the tympanic floor.

The anterior wall is quite narrow and is deficient superiorly, inasmuch as the Eustachian tube opens into the tympanum in this situation. The orifice of the Eustachian tube is about 4 mm. above the floor. Just above the entrance is the canal for the tensor tympani muscle. Below the orifice of the Eustachian tube is a thin bony lamina situated between the tympanum and the carotid canal. This bony plate is frequently thin and even dehiscent, so that the carotid artery can be seen in the tympanic cavity. This condition I noted twice. In one instance this condition was seen by me, in the living. Lying in the floor of the bony Eustachian tube, at or near the tympanic end, are occasionally noticed some cells called cellulæ tubariæ. These cells are frequently the seat of disease and frequently are responsible for unhealed radical operations, the failure of which is usually attributed to a non-closure of the mouth of the Eustachian tube.

The posterior wall of the tympanum presents in its upper part the aditus ad antrum. Below this, on the posterior wall, is the pyramid, a cone-shaped projection which contains the stapedius muscle, the tendon of which passes through an opening at the summit of the pyramid. External to the pyramid is an opening called the iter chordæ posterius, through which the chorda tympani nerve passes. Lying on the inner wall of the tympanum are to be noted several points of importance, namely, the promontory, the oval window, the round window, the processus cochleariformis and the Fallopian canal.

VI. LATERAL SINUS.

The lateral sinus, the largest of the cranial sinuses, extends from the internal occipital protuberance to the jugular foramen, where it terminates in the internal jugular vein. The course is outward and then forward. It is divided into two parts, the horizontal and sigmoid portions. The horizontal portion situated at the base of the tentorium cerebelli, is triangular on section, with the base of the triangle being directed outward. This portion grooves the occipital and parietal bones. The sigmoid portion is situated below the tentorium cerebelli and grooves the mastoid portion of the temporal bone and the jugular process of the occipital bone. It is semi-cylindrical on section. By some anatomists it is considered as a separate sinus.

The right sinus, usually larger than the left, begins at the torcular Herophili and is a continuation of the superior longitudinal sinus. The left is the continuation of the straight sinus. The superior petrosal sinus empties posteriorly into the sigmoid portion of the lateral sinus at its origin. The mastoid emissary vein entering the cranium through the mastoid foramen also empties into the sigmoid portion of the external sinus. Numerous small veins enter the sinus from the mastoid portion of the temporal bone.

The position of the sinus in the temporal bone is uncertain. It may encroach forward on the antrum or be situated well posteriorly. It may be sharply definded or shallow.

In brachycephalic skulls the sinus is supposed to be found well forward and superficial. In dolichocephalic skulls it is supposed to be placed well back and deeply seated.

These conditions may prevail in many cases, and while many observations have been made for the purpose of determining if possible the position of the sinus by external measurements, yet I am in accord with the findings of Koerner[14] and Randall,[15] who have concluded that no reliability can be placed upon external markings or measurements in determining the position of the sinus. Whiting[17] states that where the mastoid process is broad and flat, or long and pointed, the sinus is to be found far back from the meatus, and very deep beneath the cortex and diploic structure. When the mastoid process is round and narrow, or short and blunt, the sinus is situated close to the bony meatus and superficial with relation to the cortex and diploic structure.

The examination to determine the distance of the most protruding part of the lateral sinus to the suprameatal spine gave the average distance as 12 mm. The furthest away was 23 mm. Two specimens showed the sinus interposed between the antrum and the cortex. In one the sinus was in apposition to the posterior wall. The other was within 4 mm. of it.

The distance of the sinus from the spine of Henle is as follows:

Distance in mm.	No. of cases.
0	1
4	1
6	3
7	5
8	27
9	41
10	59
11	71
12	77
13	57
14	36
15	29
16	21
17	14
18	7
19	8
20	4
21	1
23	1
	463

Amberg,[16] as a result of the examination of 17 temporal bones, found the distance of the most prominent part of the lateral sinus from the spine of Henle to be from 6 mm. to 21 mm. He concludes that a sinus nearer than 10 mm. is displaced forward.

Ritter[17] reported a case in which the sinus touched the posterior meatal wall.

Berens[18] reported a case in which the sinus was displaced forward so that its anterior border was in contact with the posterior meatal wall, the sinus intervening between the cortex of the mastoid and the antrum.

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A CASE OF PRIMARY EPITHELIOMA OF THE MAXILLARY ANTRUM.*

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Mrs. L. P., aged twenty-nine years, came under observation in the summer of 1905, giving the following history:

Two years before her appearance she sustained an attack of influenza, following which she suffered from pain of a neuralgic character over the right cheek, often extending to the right eye. These pains finally subsided without any special treatment, although she reported having continuously suffered from what she designated "nasal catarrh."

Of her family history, it is to be noted that her mother suffered from cancer of the breast, and a brother and sister had been affected with pulmonary tuberculosis.

The illness dated from five months prior to her coming under observation, when intense pains again reappeared over the right cheek radiating toward the right eye. The cheek had begun to swell three months previously.

Thinking that her trouble lay in her teeth, she applied to a dentist for treatment, and had a tooth removed from the socket of which a puncture was made into the maxillary antrum. A purulent discharge followed the puncture. The opening thus made evidently soon became occluded, because the puncture was repeated ten days later, and again after an interval of three weeks.

Each of these punctures seemed to afford an outlet for accumulated pus and were always followed by a temporary remission of the symptoms. During most of this time the patient complained of a purulent nasal discharge which occasionally was tinged with blood.

The swelling of the cheek varied in amount at different times, almost disappearing at intervals.

A few days before her examination, a sensation of numbness was experienced on the affected side, and she noticed an unevenness of her mouth when puckering her lips.

Examination showed the patient to have a slight facial paralysis and an inflammatory infiltrate of the soft tissues overlying the maxillary antrum extending to the right eye, whose lids were somewhat infiltrated. Transillumination was positive on the diseased side, and intranasally, pus was demonstrable in the middle nasal meatus.

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*Read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, October 23, 1907.

In view of the failure of conservative treatment, I suggested and the patient agreed to, an radical opening of the maxillary antrum, and the operation was performed under general anaesthesia at the St. Marks Hospital.

The antrum wall was laid bare by a T-shaped incision, which exposed a small fistulous opening in its wall about half an inch above the alveolar process from which the pus exuded into the soft cheek tissues.

The osseous wall of the antrum was removed easily, the bone being necrotic. The diseased bone extended upward toward the orbital floor. As much as possible of the diseased bone was eradicated. The interior of the antral cavity was found to be almost filled with pus, detritus, and soft polypoid degenerated mucous membrane. It is to be noted in passing that at this time no hard masses were found in the antral cavity. The pus gave off a foetid odor.

The cavity was packed with gauze (iodoform) after being cleaned, and the patient made an apparently uneventful recovery from the immediate effects of the operation.

Seventeen days later, under cocain anaesthesia, a sack of pus was located and cleaned out from the soft tissues of the inside of the cheek. This purulent track was then packed with gauze.

The swelling of the cheek persisted, however, and five days later, or twenty-three days after the first operation, grandular swelling appeared at the angle of the jaw, and the patient began to run some temperature.

I then consulted with Dr. Wendell C. Phillips, and upon his advice the patient again submitted to operation.

The old wound was opened, and to our surprise the antral cavity was now found to be more or less completely filled with rather hard, gritty masses, which extended into the bucal side of the cheek from the opened antral cavity. These were removed until no more could be located. A specimen submitted to Dr. Jonathan Wright, for microscopical diagnosis gave the following:

Microscopic Examination—This growth is distinguished by atypical epithelial proliferations in indistinctly outlined areas surrounded by fibrous tissue near the fibrous tissue the epithelial cells are fairly well formed, but attain centers there are masses of degenerated hyaline and amorphous material faintly showing outlines of disintegrating epithelium, but not taking either the eosin or hematoxylin stain. The arrangement would suggest that this growth sprang from the grandular epithelium, but neither the arrangement nor the shape of the cells allow me to place definitely the origin of the growth either in the grandular or surface epithelium, but there appears to me no doubt of its malignant epithelial character.

The pain and the local symptoms subsided somewhat after this operation, although the facial paralysis persisted.

About a month later, a small inflammatory spot appeared externally on the face about one-half inch below the outer angle of the eye. This spot was surrounded by inflammatory inflatrate and the center broke down into a small ulcer. The cheek had meanwhile again become swollen. The patient was then sent to Dr. Aspinwall Judd for X-Ray applications to the ulcerated and infiltrated mass. This line of treatment was continued for some time in addition to local intraantral applications and occasional curettment of the reappearing masses in the cavity's interior.

The patient finally returned to Dayton, O., her home, and after lingering along under treatment for about fifteen months, I was informed by her physician that she died. There was no autopsy.

The case presents some interesting points. The development of a malignant growth in a young woman under thirty years of age. The rapidity of the growth, there being no evidence in the operative finding at the first operation to even suggest that we were dealing with anything other than a purulent empyema of the maxillary antrum. At that time we could not quite account for the facial paralysis, and we held that the infiltrate on the soft tissues of the cheek was due to extension of inflammation from the bone to these soft tissues.

Finally, the case demonstrated the failure of the X-Ray applications in a case where the growth was manifestly superficial in the cheek, having grown out from the antral cavity.

Our line of treatment was based upon the idea of removing as much as possible of the accessible portions of the growth and applying the X-Ray to the superficial infiltrate to favorably influence this part of the tumor.

616 Madison Avenue.

A CASE OF CARCINOMA OF THE NASO-PHARYNX AND SPHENOID REGION WHICH RESPONDED FAVORABLY TO THE USE OF RADIUM.*

BY SIDNEY YANKAUER, M. D. NEW YORK.

This patient, who is 26 years old, is suffering from a papillary, cylindrical celled, carcinoma of the nasopharynx and sphenoid region. The case is not only interesting because of the rarity of such growths in this region, especially in so young a subject, but it is also of importance, first from the standpoint of diagnosis, and second from the standpoint of treatment.

The patient states that his nose has been more or less obstructed all his life, but that during the last year the obstruction has been complete, and he has had frequent and obstinate hemorrhages and headaches. Last March, he consulted a colleague, who was kind enough to place his case-notes at my disposal. The doctor diagnosed hypertrophy of the posterior end of the left lower turbinate and some polypoid masses in the nasopharynx. Upon removal of these hypertrophies, their gross appearance seemed peculiar, so that the doctor had them examined microscopically. The report states that the growths lack all elements of malignancy.

The relief of the nasal obstruction brought about by the operation soon disappeared, and the hemorrhages continued. In June, diplopia set in, due to a beginning paralysis of the left external rectus muscle, and in July, this paralysis became complete. When the patient consulted me on October 15th I found that while the anterior half of each nostril was free, the posterior half was obstructed by a growth, which extended into the nasopharynx and filled up this entire space, so that upon rhinoscopic examination with a very large mirror, which he tolerates easily, it was impossible to distinguish any of the structures of the nasopharynx. The entire space from the soft palate to the posterior pharyngeal wall was filled up with the mass, completely hiding the choanae and the Eustachian tubes. A separate flat mass, about one inch in diameter, could be seen extending down the posterior pharyngeal wall. With a snare introduced into the nasopharynx through the left nostril, it was possible to cut off a piece of the growth, and upon examination by

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* Read before the Laryngological Section of the New York Academy of Medicine, November 27, 1907.

Dr. F. S. Mandlebaum, Pathologist to Mount Sinai Hospital, it proved to be a papillary, cylindrical celled, carcinoma.

Six months before I saw the patient, he had a condition which was diagnosed as an ordinary hypertrophy, but in which the macroscopic appearance of the growth was peculiar. As we do not ordinarily have "posterior ends" examined by a pathologist, especially in a patient at the age of 26 years, when such growths are common, it would be of special interest to all of us to hear from the doctor who removed these growths, just exactly what were the peculiar characteristics which led him to suspect their true nature at a time when the microscope failed entirely to show the slightest evidence of malignancy.

Treatment. The patient was admitted to the surgical service of Mount Sinai Hospital, with the object of removing the growth after resection of the upper jaw. It was now found that there was a slight area of anesthesia of the skin near the left nostril, and this, together with the ocular symptoms, led to the conviction that the growth had already penetrated the walls of the sphenoid cavity, and that the case was therefore inoperable. I then decided to try the effect of exposure to the action of radium.

From Dr. Morris Manges I secured a specimen of Curie radium having a radio-activity of 300,000. As the radium used by Dr. Robert Abbe, who has had such excellent results with this agent, has a radio-activity of 1,800,000, i. e., six times the strength of my specimen, I decided to expose my patient six times as long as Dr. Abbe advises; but as my specimen was known to have produced a radium burn in 20 minutes, some caution was necessary. The exposures were as follows:

November 4,	10	minutes.
November 7,	1	hour.
November 11,	1 1-2	hours.
November 14,	1 1-2	hours.
November 17,	2	hours.
November 20,	2	hours.

To-day (November 20th), after exposure for six hours ten minutes, during sixteen days, the tumor was so much reduced in size that both Eustachian tubes could be clearly outlined and the septum and lower portions of the choanae distinguished; the patient is able to breathe through his left nostril, and to spray fluids through it. The ocular palsy has not yet been affected. Unless this paralysis diminishes, it will be necessary to remove a portion of the tumor intranasally, open the sphenoid sinus and place the radium tube into the sinus itself.

I believe that the unfavorable results from the use radium reported at our last meeting were partly due to the fact that the radium could not be used boldly enough. Dr. Abbe uses larger quantities of radium, and exposes the patient for a relatively long time, as long as the individual case will stand without harm.

It will give me great pleasure to demonstrate the case again.

616 Madison Ave.

The Falsetto or Eunuchoid Voice. E. E. Clarke. *Med. Fortnightly*, Feb. 25, 1908.

The author urges the family physician to offer his advice and successfully treat a condition which is not infrequent, though a true affliction, which seriously affects a young man's career.

The enuchoid voice does not mean abnormal sexuality, for in all these cases the genital organs are found perfectly developed. The evidence shows the condition to be due to a "spasmodic adjustment of the muscles controlling the voice."

Treatment is very simple, usually of short duration, and almost always effective. It consists in "a rigid course of vocal gymnastics and monotone exercises, with development of a proper manner of breathing. From a psychic standpoint the patient should be told that his vocal apparatus is normal, and the condition certainly curable. "Begin by singing a high note and have the patient repeat it, then sing on down the scale until he has reached his lowest register, and then keep his voice at this pitch and repeat the low notes in a loud, forced expiration for ten or fifteen minutes. The low register for reading can be secured by singing his way down; then continuing in the low tone." Eaton.

AN UNRECOGNIZED FOREIGN BODY IN THE LARYNX.

BY EMILIO MARTINEZ, M. D., HAVANA.

Errors in diagnosis are many times the source of instruction and perhaps more so than the study of successful cases. Without any desire to criticise the work of the able laryngologists who handled this case before I did and without any attempt to excuse my own error, I think that this clinical history is not devoid of interest.

Near the end of February last, a young man named Adolph L., a native of Cuba, twenty-five years of age, mechanic, consulted me, making the following statement:

On the night of July 18th, 1905, while living in Brooklyn, N. Y., he had the misfortune to swallow his tooth plate. Dr. B., who attended him at first, tried to extract it but found it impossible and took him to a hospital nearby, where another trial was made under chloroform, also without result. Next day a radiograph was taken and he was sent to another hospital in Brooklyn, and esophagotomy performed the afternoon of the twentieth, and the plate safely extracted. He remained in the hospital for a month. Near the end of September he was able to work at his trade as a mechanic, and went to his shop; but he noticed that his respiration was short and he suffered several attacks of asphyxia. He applied agan to Dr. B., who performed tracheotomy on the ninth of October. Following this operaton his larynx was treated, several incisions were made and intubation was attempted twice, but he could not retain the tube. Nineteen days after tracheotomy the canula was removed, but had to be replaced; four days later he was discharged from the hospital. Dr. B. treated him at his office up to the middle of December, without any benefit. A friend took him to one of the large New York Dispensaries, which he attended regularly and was assisted by prominent specialists. He states that he was considered "an interesting case," that many doctors examined him and he served as a subject for various lectures before a large class. He was treated all this time with high doses of iodide of potassium. The professors of this dispensary refused to withdraw the canula and sent him back to his doctor. Dr. B. advised him to wait seven or eight months to have his canula removed, but as he had to live by his work and he could not do it as a mechanic in this condition, he resolved to return to Cuba and sailed on the eighth of February.

When I saw this young man on his arrival on the 12th of February of 1906, he had a complete paralysis of the left vocal cord, evidently from injury to the left inferior laryngeal nerve during the esophagotomy, and marked laryngeal stenosis, not only from the paralysis of the cord, but also from the swelling of the right ventricular band, which occluded the cord on that side. There was apparently no growth on the surface, because the mucous membrane was normal, but the movements were impaired. The patient was hoarse, although he could make himself understood with the tracheal tube closed. A slight cough, every now and then, brought up some secretion but otherwise he was not troubled by his larynx, there being no disphagia, or pain whatever. His general health was excellent.

I did not make a diagnosis, but was inclined to accept the possibility of syphilis of the larynx, as the New York specialists had done, although any antecedent in this respect was denied. He went to his home at Matanzas and two weeks later wrote to me that Dr. O. of the Matanzas Civil Hospital was disposed to withdraw the canula if I advised it. I made no objection, provided he remain at the hospital for some time to avoid an accident. The canula was taken out, and he breathed tolerably well, although he could do no hard work. He remained with his family at Matanzas up to October of the same year, returning at that time to Havana with increased difficulty in respiration, which subsided after treatment with steam inhalations. In December, he once more returned with an attack of asphyxia and I sent him to the Mercedes Hospital of Havana, and my assistant, Dr. Hernando, performed tracheotomy again. He was discharged and returned home, but in March of this year he came back resolved to have something done because he could do no hard work with his canula in place.

I had discarded syphilis as a diagnosis by this time because iodide of potassium had no effect on the lesion; it was not a cicatricial post syphilitic stenosis but an active subacute process. The possibility of neoplasia was suggested by a prominent laryngologist of Havana, who examined the case with me, but the age of the patient and the long time the trouble had remained stationary, obliged me to abandon this diagnosis also; I then suspected there might be a perichondritis of the interior aspect of the thyroid plate. but really this had no better foundation than the preceding ones. I explained the situation to my patient and proposed an exploratory thyrotomy, requesting his permission to proceed then according to the conditions that I might find in the larynx. He willingly accepted and would submit to any risk, as life was a burden to him with this disease.

With a free hand to do as I might think proper, I opened his larynx on the 20th of March (1907), in the ordinary manner for thyrotomy, and after cutting through the cartilage I found the mucous membrane separated, forming a cavity which I supposed was the area of necrosed cartilage. Passing in a curette I commenced to scrape on a rough surface. Very much pleased to have found a diagnosis for my patient, when suddenly the rough surface gave way and I brought it out on my curette. It was a flat bone with a rounded border and rough ends, evidently a fragment of a small rib, the patient supposes, a piece of mutton chop, which he was very fond of eating. The cavity was full of granulation tissue, but otherwise was smooth. After placing a catgut suture to readjust the thyroid, I closed the wound.

The patient made an excellent recovery, and two weeks later I removed the tracheal canula, there being no longer any stenosis and the man breathed freely through his larynx; a small flap of mucous membrane which protruded from the ventricle, I excised with a laryngeal guillotine. He has returned to his shop in Brooklyn, and on the ninth of November last he reported that he was in good condition.

Reviewing the case, I presume that the patient swallowed the bone some time in September, 1905. On account of the recurrent paralysis, he could not dislodge it. He told me that this often happened to him, at that time with grains of rice and other small food particles. The bone was forced into the right ventricle and formed a cavity for itself eroding the mucous membrane and remained there, occluding the lumen for twenty months.

Two important conclusions may be derived from this case:

(a) The remarkable tolerance of the larynx towards a foreign body for so long a period as twenty months, without impairing the patient's health, without great pain and with the only inconvenience of obstructing the glottis by its bulk.

(b) The danger to which any person, with recurrent paralysis, is exposed by his inability to expel a foreign body falling in the cavity of the larynx.

Neptuno 50.

LARYNGEAL NEOPLASMS IN AMERICA.*

BY J. LESLIE DAVIS, M. D., PHILADELPHIA.

While the subject of my paper has been announced "Laryngeal Neoplasms in America," it is only so far as they are concerned in the etiology, aggravating complications and confusion in diagnosis that I have touched upon any neoplasms other than carcinoma. "A Brief Inventory of American Opinions on Carcinoma of the Larynx" would be more appropriate.

The magnitude of the subject, the limitation of time for its presentation and the desire for free discussion demand this curtailment of the scope we shall cover.

The history of carcinoma, whether of laryngeal location or elsewhere, is an interesting story in itself. Clouded always in obscurity, regarded from the early centuries to the present time almost universally as a scourge beyond the power of prevention or the chance of cure, it has builded about itself, through distorted imaginations and the insanity of superstition, a barrier through which the bombardment of scientific research has been slow to penetrate.

But passing this and many other points with mere mention, recognizing the thoroughness with which it has already been covered by numerous writers, I shall without apology choose the more practical features that have been equally as well covered, believing that the greatest need of the hour is the iteration and reiteration of principles already propounded, even though nothing new may have been discovered.

I have, furthermore, chosen to summarize deductions from work done within a certain geographical limit, not with any intention of comparison, not with the idea that what concerns the welfare of one country in the working out of its sufferers' "salvation" is in anywise foreign to the interests of any other land where man is found, nor with the delusion that any line of investigation is being or could be carried out here independent of or uninfluenced by deductions, either true or false, which have been brought out in the work of master minds across the seas.

But in this day when index files are so well distributed, and the literature itself so easily accessible, so thoroughly has the work in foreign fields been collected and brought within the range of our reading that any further attempt at compilation would be only to repeat what has already been ably done by others during the past few years. In fact, there are those who become even more familiar with, and more interested perhaps in, what our distant neighbors are doing, less familiar with the work that is being done and more which needs to be done around us, and entirely oblivious to the fact that in the working out of the mighty task each of us may have some part to perform.

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*Read before the Twelfth Annual Meeting of the American Academy of of Opthalmology and Oto-Laryngology, Louisville, Ky., Sep. 26-28, 1907.

Acknowledging anew, then, our debt of gratitude to the cohorts of the conquering hosts wherever they may be, let us proceed to a brief review of our own "Home Guards" in whose rank and file march veterans of the early struggles and younger volunteers alike, who, in spite of discouragement, are waging slow, perhaps, but effective warfare against this dread enemy of all nations.

It is impossible to consider cancer of the larynx and the effort toward its control independently of the study which has been made of cancer involving other structures of the body, since the laws governing its nature and development are the same wherever found, and, while the larynx is one of the less frequent sites, we can point with pride to the work of a few laryngologists in the front ranks of advanced research. To answer, then, "What have been the perils to progress, and what are the factors that facilitate the study of laryngeal carcinoma?" would be, in a large measure, but to answer the same questions applied to carcinoma without restriction as to site.

Roswell Park, in a recent report of the work of the New York State Cancer Laboratory, speaks thus interestingly of the difficulties at the beginning of their undertaking eight years ago, which in reality differs little from the situation twenty years ago: "The motives which prompted its foundation were the inadequacy of the methods applied in the study of the disease, and the entirely partisan views held by practically every investigator of repute. The histologist regarded cancer as a matter of peculiarity of cell structure; the embryologist held it due to peculiarity of cell activity when actuated by hereditary influences or embryonic perversion; the first looking to the cell itself, the latter to its environment and proclivities. The pathologist could advance numerous suggestions, all the outcome of a study of deadroom specimens, through brass tubes, all ingenious, some extraordinarily and incomprehensively so; all displaying familiarity with the minutiæ, and all evincing especially a lack of familiarity with the disease in the living body—a lack of which has characterized most of the published work on the etiology of cancer. Tradition or adhesion to long-established methods had governed all modes of investigation, yet no one had the originality to depart from them. A general spirit of pessimism prevailed in all quarters, the more so as a study of statistics made it appear that cancer mortality was on the increase, at least in those parts of the world which most interest us. This spirit of hopelessness had not exhausted concerted effort, but had rather paralyzed endeavor. It was difficult to secure either men who would devote themselves to such blind work, or money to support them in such efforts."

He further states that finally they succeeded, with the result that there was established in Buffalo the first laboratory ever created for the concerted or deliberate study of the most mysterious disease known to us—one which annually kills seven thousand inhabitants in the State of New York alone. He closes with this personal sentiment: "I can not help feeling that we are much nearer the secret so long sought than we were eight years ago. In fact, I feel that the past eight years have taught us more than the previous eight decades."

The work being carried on by this laboratory in Buffalo is to be strongly commended by every one interested in the welfare of humanity, both professional and layman alike.

In reviewing the literature of American authors during the past twenty years on carcinoma of the larynx—which covers the literature of the world as well—one can not fail to be impressed by the truth of the observation made by Delavan regarding surgical statistics, which could be applied equally as well to data other than surgical, namely: "There can be no statistics possessed of definite value or of conclusive weight until a sufficient number of operators of accredited standing in the surgical world have been willing to faithfully and fully report in all of its detail every case which they have had. All thus far published are not only too promiscuous—representing an aggregation of isolated cases with a tendency to the suppression of unfavorable results—but they are further untrustworthy by reason of confusion of cases, with resulting repetition which tends to invalidate percentages."

Thus in an endeavor to obtain a just estimate of the present attitude of the American profession regarding carcinoma of the larynx, it was my purpose to supplement published records by direct expressions from men engaged in laryngeal work throughout the United States and Canada, desiring particularly personal observations whether in keeping with or differing from the generally adopted conclusions. Unfortunately this course was adopted too late to obtain the good which otherwise might have resulted, since the letters being sent out about August 1 reached their destinations after a considerable number of the men had gone on their vacations, and who returned too late in the summer to compile in a complete form the information requested.

However, from a total of about one hundred and fifty letters mailed I had the gratification of receiving over one hundred replies, some of which were from men who have become well known through extensive work and former publications on the subject; others who had reported but a few cases, and still others who, having come in contact with but a still smaller number, had not reported them nor had they preserved records.

Thus, while some of the answers given were from general observations, rather than from actual calculations, I feel that they are not without value, particularly points not involving percentages.

For the fuller records given I beg to acknowledge my indebtedness to Drs. J. Solis-Cohen and Joseph S. Gibb of Philadelphia, Chevalier Jackson of Pittsburg, Charles K. Knight, Wendell C. Phillips and Jonathan Wright of New York, Walter E. Murphy of Cincinnati, J. A. Stucky of Lexington, W. L. Ballenger, Joseph C. Beck, Otto Freer and Otto J. Stein of Chicago, Henry L. Swain of New Haven, W. Barclay Stephens of San Francisco, James F. McCaw of Watertown, John F. Barnhill of Indianapolis, and George L. Richards of Fall River.

Since some of the reports failed to mention the number of cases treated, I am unable to give an exact aggregate of the total from which my deductions are drawn—though approximately about two hundred—and it is from these alone that the following estimates are made.

About 90 per cent. of cases were males.

In less than 10 per cent., including distant relatives, could hereditary history be obtained.

The wide range in the observations of different men renders the percentage of heavy smokers and alcoholics difficult to obtain. Cohen states: "I attribute no etiologic significance to either excess," while Jackson, Knight, Murphy and Swain report a majority of their cases addicted to both, particularly smoking.

All agree that the most common of early symptoms observed either by them or by the patients was hoarseness.

Pain was not found to be a frequent symptom before the later stages.

Jackson, Freer and Stephens report cases in which pain was absent throughout the course of the disease.

In the early stages, the vocal cords were reported as the most frequent site of intrinsic involvement; the epiglottis and the arytenoids being the most frequent in extrinsic.

The most frequent causes of death were toxemia, starvation and exhaustion.

None believe that any internal medication, alteratives, etc., will affect the growth of the tumor; nor that any local applications have any permanent beneficial influence. All favor operation if it can be done in the early stage. The most common methods employed are thyrotomy in intrinsic and laryngectomy—partial or complete—in extrinsic. Life is lengthened by operation in a majority of cases, and the patient is made more comfortable while life lasts in a very great majority of cases. The percentage in which life is shortened by operation is very small if done early.

To the question, "From what source is the most hopeful outlook for the future prophylaxis and treatment of this disease?" I received a greater number of "blank returns" than to any other question asked; and yet most of those who did reply show a marked unity of opinion, varying mainly in a slight difference of expression.

Beck: "Through mode of living, prevention of irritation, and early operation when discovered."

Ballenger: "Early diagnosis based on (*a*) constant hoarseness, (*b*) age, 40 or past, (*c*) paralysis of one cord."

Cohen: "Early diagnosis and prompt evulsion."

Freer: "To educate the general practitioner to consider all cases of hoarseness in persons past middle age (especially men) serious. Better statistics, earlier diagnosis and operation."

Gibb: "From bacteriological research, and the discovery of an appropriate antitoxin."

Jackson: "General recognition of the frequent malign nature of chronic hoarseness."

McCaw: "In establishing the etiology and nature of growth."

Phillips, Stein, Richards: "Early diagnosis and operation."

Swain: "The recognition of chronic hoarseness as suspicious."

Jonathan Wright: "From a general study of biological processes of nuclear division."

From these personal communications, then, and from published opinions of the past two decades, we can make the following deductions:

ETIOLOGY.

On this point one might modify an utterance of the psalmist of old and well express the situation thus: "Day unto day uttereth speech, but night unto night *faileth* to show knowledge." Various and manifold have been the theories advanced, and yet so frequently have the assertions of yesterday been retracted or refuted to-day that we hardly dare to prophesy for to-morrow.

Animal experimentation, which was for a long time resorted to without any appreciable results in adding to our knowledge of the nature of cancer, has in recent years received a new impulse with the studying of rat or mouse tumors, which seem to be the nearest approach to human cancer yet discovered.

Thus, in support of the parasitic theory, Gaylord cites the instance of an infected cage purchased from a dealer and brought to the New York Cancer Laboratory, out of which sixty or more tumor mice had been taken in the course of three years by the dealer, and in which five cases of cancer developed after the cage was brought to the State Laboratory. He furthermore states that in the State Laboratory, since the beginning of 1905, a typical small spirochaete has been found in all the transplanted tumors thus far examined.

Clowes, of Buffalo, says: "The discovery of the ease with which mouse tumors may be transplanted has led to the development of experimental research in cancer on such a scale as could never have been contemplated five or six years ago."

Bainbridge, in speaking of cancer in general, believes, from the mass of conflicting evidence, the following may be safely adduced, and until the cancer problem shall have been solved will lead no one into danger, namely: that the hereditary and congenital acquirement of cancer are subjects which require much more study before any definite conclusions can be formulated, and in the light of our present knowledge hold no special element of alarm. That the contagiousness or infectiousness of cancer is far from being proved, and that its communication from man to man is so rare, if it really occurs at all, that it can be practically disregarded. And, lastly, that cancer is local in its beginning.

From the standpoint of predisposing causes it is an interesting fact that cancer shows an increase in direct proportion to the advancing scale of civilization; that cancer is least common in the country districts and most common in the larger cities. In other words, the closer to Nature the individual's habits and the less artificial his manner of living, the rarer are his chances for the "contraction" of malignant disease in any form.

It has been well established and generally accepted that the most frequent immediate factor in the production of cancer is some form of irritant, from which stimulation there is brought about a riotous proliferation of cells while free from their natural restraint.

In the case of laryngeal carcinoma, however, it is not only difficult, but oftentimes impossible to attribute its production to any definite exciting agent.

Thus there is no recognized common cause.

That carcinoma of the larynx occurs most frequently past middle life is in keeping with the characteristics of general cancerous conditions, but that a large majority of cases occur in males is one point of difference, and should be borne in mind in case of suspicion or of doubtful diagnosis.

Some have advanced the opinion that carcinoma of the larynx is brought about through improper or forcible use of the voice, though Jackson observes that in Pittsburg, where chronic laryngitis is exceedingly common, especially among those who use their voices out of doors in all kinds of weather, malignant disease of the larynx is not more frequent than in other large cities with better climate and less frequent occurrence of chronic laryngitis.

Cases are on record which seem to point to tobacco or to alcohol as an unmistakable cause, yet the sum total of evidence does not justify a belief that it plays any important part.

A case now under the writer's observation—age 50 years, who developed an intrinsic carcinoma of the larynx about a year ago—states that for a period of twenty-five years he smoked on an average over twenty cigars a day, and that in recent years he had also been addicted to an excessive use of liquor.

It was this case in which the cause seemed so direct that influenced me to make a special investigation of the part played by tobacco and alcohol, and I confess that it was not without a degree of disappointment that I had to withhold judgment on the ground of insufficient evidence.

Cases are reported in which carcinoma has occurred in connection with or following syphilitic involvement of the larynx, and likewise malignancy has followed the occurrence of benign tumors—a condition, no doubt, which was in either case the result of prolonged constant irritation.

Wright says: "We must allow the possibility of a benign tumor becoming malignant, though the strongest microscopical proof must be required to admit of its probability in any case." To this observation Jackson adds that to demonstrate the benign nature of any growth it is necessary to excise a portion of it all the way down to and including healthy tissue to make sure that there is not a papillomatous or other benign proliferation on the surface of a malignant growth.

The possibility that in the common symptom of chronic hoarseness may be found a clue to a frequent cause is not to be lightly overlooked.

Jacobson observes: "Etiologically, cancer is of intangible dynamic nature, which explains the baffling of investigators; they are looking for something tangible, though the tangible things they find are all secondary.

DIAGNOSIS.

If in the light of present knowledge cancer is to be regarded as local in its origin, and that in this early period of confinement it may be removed by radical operation so perfectly that the chances are overwhelmingly in favor of its non-recurrence, then does the burden of responsibility rest heaviest upon those in position to make the earliest diagnoses.

To me the most promising outlook for the future control of laryngeal cancer comes not from laboratory prophesies of approaching revelations in the nature and cause of the condition, small though our knowledge at present may be; not in the hope of new methods of detection or of signs pathognomonic, though confusion of symptoms may cause deadly delay; not from any fancied faith in the final discovery of a specific, though we would hail such a cure with though our present can not be called faultless; *but rather in a crusade already begun that shall sweep our whole country in teaching the few principles already proven for making the earliest diagnoses.*

To make this most effective is needed the cooperation of every teaching institution, and the author of every text-book that deals not only with the special branch of laryngology, but general diagnosis as well.

Consult the list of our most popular text-books on the practice of medicine, or on general diagnosis, and note how few contain any reference at all to malignant disease of the larynx, and yet it is on these that the majority of general practitioners have depended. From one of the most authoritative of modern books on medical diagnosis I quote: "Malignant disease in various forms may affect the structures of the larynx. A positive diagnosis can be made only with the aid of the microscope. Yet the detection at the seat of the larynx of a growing tumor accompanied by severe cough, by sanious sputum, by signs of destruction of tissue, by perichondritis and exfoliation of the laryngeal cartilages, by hemorrhages and by emaciation, warrants the diagnosis of cancer, whether or not much pain be present. This may be confirmed by the subsequent rapid development of the malignant disease, association with a musty odor of the breath, distress in swallowing, bloody expectoration, and cachexia."

Such is the clinical picture found in many a case when referred to the "specialist" for treatment.

At least one good lesson is derived from a statement made in not less than ten of the answers received in reply to the aforementioned circular letter sent out to laryngologists: "I am not in position to make any report on carcinoma of the larynx; while a number of cases have come under my observation, the disease was too far advanced when first seen for anything to be done."

Was it the general practitioners' fault that these cases were so far advanced before being diagnosed, if in his college course or textbook reading a method of early detection had not been taught?

Can the patients themselves be blamed for believing that cancer is a disease for which nothing can be done?

Hence we hail with delight the encouragement which has been given to clinical teaching of the "special branches" (otolaryngology, etc.) in some of our leading medical colleges in recent years.

The student of to-day is the physician and the teacher of tomorrow, in the thoroughness of whose education rests the nation's hope for the future dissemination of knowledge.

In this connection we might well call attention to one great peril to progress in the tendency of patients to diagnose their own conditions from "knowledge" gathered from the lay press—which ofttimes is but a wild and erratic creation from the fertile fancy of a dreaming reporter—and then treat themselves with concoctions and cures, which the same press advertises, till all chances for relief through rational means are lost by delay.

No new theory relative to disease, says Bainbridge, can be propounded or research work reported without the probability of exaggerated versions thereof being flaunted in the public press of the civilized world to make upon the minds of the credulous masses impressions for good or ill as the case may be. Reputable physicians, actuated by one kind of motive or another, not infrequently give expression through the medium of the medical press to conclusions drawn from premises that have not been and often can not be verified, and thus confusion worse confounded arises in the public mind concerning matters medical. The public has a right to know the results of all scientific research, particularly as it pertains to health and disease, and more particularly when the public's money defrays the expense thereof. But they should not be overwhelmed with theories formulated in the laboratory, and frightened by specters that oftentimes exist only in the microscope, or rather in the mind of the microscopist.

Chronic hoarseness in the aged is the most trustworthy early warning of possible malignancy that we have..

The characteristic lancinating pain of carcinoma in other parts of the body are not present in all cases of laryngeal carcinoma, and then not before the later stage.

In Stein's admirable paper before the Academy last year we find this statement: "Just because a patient manifests no characteristic cachexia or has no dyspnea or fetid breath, blood-stained expectoration or pain referred to the ears, does not justify one in dismissing the consideration of the possibility of malignancy. To wait for these classic symptoms (these text-book symptoms) is to throw away in many cases the last hope of saving one's patient."

The following observation by the same author is timely: "One of the strongest clinical evidences of malignant involvement I have found to be infiltration. The infiltration is not pathognomonic nor has it any characteristic appearance. Many of these infiltrations have no sharp line of demarcation, but blend imperceptibly with the surrounding structures. At times the infiltration originates deeply or in recesses like a ventrical or is hidden from observation by the cords so that its early recognition becomes impossible; but on account of the pressure it may exert on a branch of the motor nerve or by direct encroachment on the intrinsic muscles there is seen a lazy action of the vocal cords. This sign of lagging during an attempt at phonation when associated with chronic hoarseness should always arouse suspicion and awaken watchfulness."

Syphilitic and tubercular lesions of the larynx may give rise to confusion in diagnosis, particularly the former, in which case the therapeutic test is to be employed. Owing to history, age, location and character of onset and mode of development, tubercular involvement is usually far more easily differentiated.

Simple papillomata are the most frequent benign neoplasms, and likewise the most frequent source of anxiety to the diagnostician. Probatory intralaryngeal removal of pieces of a growth for examination should not be done without consent to radical operation if found to be malignant, and the piece removed must represent all parts of the tumor.

TREATMENT.

This division may be considered under two heads—surgical and non-surgical, either method having advocates equally emphatic in their claims of cure, with cases of non-recurrence to support them in their views, and there are those who condemn all methods alike as futile. "All honor to him who honestly doubts, if through doubt arises investigation, and through investigation conviction," but let us strive not to become prejudiced against any method which has not been fairly tested, nor overzealous for another till it bears the test of time.

The sum total of evidence is to-day undoubtedly in favor of radical operation, thyrotomy being employed in intrinsic carcinoma, and laryngectomy, partial or complete, in extrinsic; and in either case the nearer the operation follows the incipient stage of involvement the greater are the chances of cure.

The question, "Who should operate, the general surgeon or the laryngologist?" has ofttimes been discussed. The argument has been advanced that the one most accustomed to doing major surgical work will employ most careful technic as well as skill in its application. On the other hand, should not the laryngologist who devotes his whole time to the study of a localized field, to its functions as well as its structure, acquire the most perfect knowledge of the part?

It has been suggested that in such operations the laryngologist and general surgeon each has a part to perform; but whoever the operator may be, in the words of Watson, "he must see to it that his enthusiasm is tempered by experience, his courage justified by skill."

The technic of operations does not come within the scope of this paper. Suffice to say that I have been unable to find in the latest American literature anything that could add to the excellency of such methods as those so effectually employed or recommended by Cohen, Crile, Delavan, Halstead, Hartley, Jackson, Keen, Knight, Mackenzie and others.

Of the non-surgical means which have been employed in treatment we shall not attempt to tabulate those already discarded—even though they at some time may have been widely and enthusiastically advocated, but rather give space to a brief consideration of methods which are now being tested.

Treatment by pancreatic enzymes, while discredited by the majority of the profession, must still be regarded as an unsettled question. We shall await with interest the further tests being carried out by one so competent as Bainbridge, who in a preliminary statement remarks:

"Needless it is to say that a few months' trial in a limited number of selected cases can not suffice to forever settle the merits of any method of treatment of cancer."

In view of his name having been used against his will in connection with a reported case of remarkable results from use of trypsin, and widely published by the lay press as well as in medical journals. Dr. Bainbridge says: "In justice to the earnest, truth-seeking element of the profession, both here and abroad, in justice to cancer sufferers the world over, in justice to Dr. Beard and, lastly, to myself, I find it necessary to write as I do now in advance of further definite information. To remain silent longer would tacitly give assent on my part to much that is misleading. The facts as they pertain to the case published do not warrant the slightest enthusiasm as regards cure. While this case is full of disappointment, it presents certain features which give sufficient ground for careful trial of the pancreatic treatment."

T. H. Evans, writing of the presence of sugar in cases of cancer, states that the use of either trypsin or amylopsin will probably be rendered more effective in connection with a diabetic diet. "It is evident that the conflagration of sugar in the body may be destructive to surrounding tissue. We do not wish to supply fuel to the match which we apply in the form of pancreatic ferments." He further observes that the use of diabetic diet should be thought of as a postoperative treatment in cancer, which may delay metastasis and return, and that it is possible that cases of inoperable cancer may be rendered operable by the employment of injections of trypsin or of amylopsin, or of both with an absolute diabetic diet.

The x-ray treatment must be regarded of value when applied in connection with or following operative procedures.

Delavan speaks of the x-ray as the best means at our command for the relief of some of the worst symptoms of advanced laryngeal carcinoma, such as pain, excessive secretion and fetor.

Of the ultra-violet and the high-frequency rays, and likewise of radium from which interesting results were expected, I have not been able to find any reports of conclusive evidence regarding their value.

The field of therapeutics has been well worked, but without avail, in search for an agent that will exert some influence over malignant growths. Still, there are well-marked indications for therapy which should be met as they arise. If toxemia is the most frequent cause of death, it should be guarded against by promoting free elimination throughout the course of the disease. Exhaustion must be met by stimulation, and starvation obviated through some means of nutrition adapted to each case.

1700 Walnut Street.

A Fatal Case of Anglo-Neurotic Œdema. HENRY BAZETT. *Lancet*, Oct. 12, 1907.

The author was called to see a man, aged 23, seized with choking, but found on arrival he was dead. The eyelids of both sides were so swollen that it was difficult to get any view of the pupils; the cheeks and lips were swollen; and the neck appeared to be nearly twice its natural size. The remainder of the body was unaltered and ill-nourished.

Post-mortem examination revealed marked oedema of the ary-epiglottic folds. The urine was normal.

Previous history of the case showed that, since the age of 6, the patient had been subject to attacks of abdominal colic, with sudden swellings of various parts of the body, usually in the hands, thighs or scrotum, and subsiding in twenty-four hours.

THOMSON.

A METHOD OF PREVENTING HEMORRHAGE DURING ADENECTOMY.*

BY SAMUEL IGLAUER, B. S., M. D., CINCINNATI.

The operation for the removal of adenoid vegetations is usually attended by the loss of a considerable volume of blood. If, as is usually the case, tonsillotomy be performed at the same time, the total hemorrhage is of necessity increased.

Considering the fact that the adenoid patient is often a delicate, anemic child, it would seem desirable to limit the operative hemorrhage, if possible. There can be no doubt that a sudden loss of blood increases the danger of the anaesthetic, as well as the shock of an operation. Hemorrhage also increases the risk of infection, as proven by studies in experimental anemia in animals. (Albutt's System of Medicine.)

One of the chief difficulties encountered by the operator during adenectomy and tonsillotomy, is the hemorrhage, obscuring the field of operation. In other branches of surgery, the operators pride themselves upon minimizing the loss of blood, and there is no particular reason why the laryngologist should limit his endeavors in this direction. From a cosmetic point of view, adenectomy is far removed from the domain of "beautiful" operations, and in our general hospitals one now seldom sees a considerable flow of blood, except at the hands of the obstetrician, and of the laryngologist. Hitherto considerable attention has been paid to the position of the patient during adenectomy in order to avoid the aspiration of blood, but practically nothing has been done to prevent the hemorrhage itself.

Technique: In order to control the hemorrhage of adenectomy, I have devised the following method: It consists essentially in introducing the draw-strings of a post-nasal tampon before beginning the operation, and in drawing the tampon into place immediately following the adenectomy.

The instruments necessary for this procedure are, first: A modified Bellocque canula, made of a slender, hard rubber Eustachien catheter. I have found the ordinary metal canula too thick and rigid for this purpose. Second: A rubber sponge (such as may be purchased at any drug stone), of proper size, to serve as a post-nasal tampon. These sponges, owing to their elasticity, make excellent tampons and can readily be sterilized by boiling. A stout piece of tape is passed through the sponge, tied about it and left with the ends about a foot long. The patient is anaesthetized until the pharyngeal reflex is partially abolished.

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* Read before the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., September 26, 27 and 28, 1907.

By means of the canula introduced through the nose, one end of the tape is withdrawn through the nasopharynx and out of the nostril. The other end of the tape with the tampon attached is allowed to hang out of the mouth. An assistant now makes traction upon the two ends of the tape, which thus serves as an admirable palate retractor, giving the operator more room and permitting the use of the curette or of a forceps with but little danger of catching the velum.

The adenectomy is now performed in the usual manner. Immediately thereafter the tampon is forced into place by the assistant drawing on the nasal end of the tape, while the surgeon with his index finger crowds the plug into the naso-pharynx. Owing to the size and elasticity of the rubber tampon, the hemorrhage is immediately controlled.

The operator can now proceed with the removal of the tonsils, if these are enlarged. In case the tonsils are very large, they should be removed before beginning the adenoid operation.

The tampon is allowed to remain in position for a few minutes after the adenectomy, when it may be removed, as there is but little tendency to hemorrhage after the tampon pressure has been maintained for a short time. The tampon is easily withdrawn by pulling on the one end of the tape which has been left long for this purpose.

Report of Cases: I have notes on eighteen cases in which I have employed this method. The patients ranged in age from two to seventeen years. Gas and ether, or ethyl chlorid and ether were employed in all the cases, excepting one case of ethyl chlorid, and one of straight ether anesthesia. In practically all the cases, the tonsils were removed at the same time as the adenoids and this may account for the blood vomited by some of the patients. This vomiting, however, is recorded in the first five cases when the technique was being perfected, and is noted but once in the succeeding operations. The primary hemorrhage was easily controlled in all the cases in which the tampon was properly inserted. There were no secondary hemorrhages.

The Bellocque canula should be introduced with great care in order not to wound the nose or the adenoids. With the ethyl chlorid cases, the anesthesia was too transient for this method.

One or two of the patients, insufficiently anesthetized, seized hold of the draw strings. There were no ear complications in these cases and no sequelae traceable to the tamponade. I am indebted to Dr. Dickson and Dr. Enz for assisting in the tabulation of these cases.

Conclusions: It must be admitted that certain disadvantages attend the method of operating described above. In the first place it requires a somewhat deeper anesthesia than ordinarily employed for the adenoid operation. Secondly, owing to the time occupied in introducing the tampon, it cannot be employed with evanescent anesthetics, such as ethyl chlorid or nitrous oxid. Finally, it slightly complicates an otherwise rather simple operation and requires the aid of a good assistant.

The advantages which result from the employment of the tampon method may be enumerated as follows:

1. The draw-strings acting as a palate retractor protect the velum and permit a more thorough use of the adenoid forceps than is ordinarily the case.

2. The hemorrhage is checked immediately it is begun. The loss of blood is thus reduced to a minimum, decreasing the immediate risk of syncope and the subsequent chances of infection.

3. The field of operation is left anemic for tonsillotomy.

4. Ether anesthesia, (or gas and ether anesthesia), much safer than chloroform, may be employed, since the cerebral engorgement resulting from ether inhalation is counteracted by the tampon.

5. Post operative nausea and vomiting due to swallowed blood are partially obviated.

6. The danger of aspirating blood into the trachea is diminished.

These considerations it would seem make this method worthy of further trial and extension, so that some day combined adenectomy and tonsillotomy may become an almost bloodless operation.

22 West Seventh Street.

HEMORRHAGE FOLLOWING TONSILLOTOMY WITH COLD WIRE SNARE.

BY C. R. DUFOUR, PHAR. D., M. D., WASHINGTON, D. C.

For several years I have been removing faucial tonsils with the cold wire snare, finding it to be the most efficacious method of removing them. Years ago I discarded the tonsillotome, as being cumbersome and not an efficient instrument. Enlarged or submerged tonsils can be entirely enucleated and with less hemorrhage by means of the snare than with the tonsillotome or scissors.

In hundreds of operations I have had only one severe hemorrhage from the use of the snare. The case is as follows: Mr. L. white, aged 35 years, came into my office and requested me to remove his tonsils, saying they bothered him very much and caused a continual bad taste in his mouth, and that he had frequent attacks of tonsilitis. I found them very large and standing out prominently from between the pillars. The crypts were filled with cheesy matter, the odor of which was very offensive. They were hard and fibrous in character. I told him I would only remove one at a sitting, to which he consented. After swabbing it with a 6 per cent solution of Alypin, I loosened the pillars, with a tenaculum drew the tonsil into the snare and completely enucleated it. There was not much bleeding. After keeping him in the office for a while, I sent him home, with orders to remain quiet until the next day. That afternoon a physician 'phoned me that there was in his office a man whose tonsil I had removed that morning, that it was bleeding so persistently that he could not arrest it, having run the gamut of styptics. I requested that he be sent to my office, which was done. I tried to arrest the bleeding with the galvano-cautery, pressure, etc., but could not. The vessel was at the bottom of tonsillar space, near base of tongue. I soon found that it was no ordinary hemorrhage and must be stopped at once, as he had lost two or three pints of blood. I sent him to the hospital, and while waiting for me, he lost at least another pint. I arrived at the hospital about fifteen or twenty minutes after he did. I took him to the operating room, placed him on his back on the table, and by aid of an electric head mirror to illuminate the throat, I passed a suture through the lower part of the posterior pillar, drawing it forward and over the bleeding vessel, the suture was then passed through the anterior pillar. A continuous suture was thus used, suturing posterior and anterior pillars together. This stopped the hemorrhage at once. He was kept in the hospital all night. He refused to remain longer, so went home the next morning. I judged that he lost between three and four pints of blood. He was pretty well exsanguinated, but soon recuperated. The stitches were removed in a week.

1343 L street.

Nasal Suppuration Due to a Rhinogith Causing Complications Simulating a Gastric Affection. Dr. GAYET. *Presse Med.*, April 24, 1907.

The case was a young man of 19, who, after a pleuro-pneumonia complicated with peritonitis, had discharges and fetid vomitings suggesting gastric disease. After a prolonged examination, the seat of the putrid discharge was found under the inferior turbinate body of the nose. Here in the midst of the discharge and debris was found a canine tooth which was missing from the superior maxilla, the last incisor being almost in contact with the first molar. The patient recalled having had a severe blow on the nose in his early infancy. All the symptoms disappeared on the removal of the foreign body. SCHEPPEGRELL.

Radical Cure of Chronic Suppurative Otitis Associated with Mental Confusion. Dr. GUISEZ. *Bull. de Laryngol*, Oct. 1, 1906.

The author reports the case of a young girl in whom the radical cure of a double otitis of long standing caused the disappearance of mental disturbances of a confusing character.

The relation existing between the mental disturbances and the diseased condition of the ear had been remarked for a long time; most frequently there were phycho-sensorial disturbances (hallucinations of hearing) more or less directly connected with the lesion of the auditory apparatus.

The cases of mental affections so distinctly characterized and consecutive to a suppurative otitis are somewhat rare, and give interest to this case. SCHEPPEGRELL.

A CASE OF SEVERE PRIMARY HEMORRHAGE FOLLOWING THE REMOVAL OF THE FAUCIAL TONSIL.*

BY OTTO J. STEIN, M. D., CHICAGO.

Every case of severe hemorrhage following the removal of the faucial tonsil is of sufficient importance to be placed upon record.

The report of the following case records the severest hemorrhage following this operation in my hands, and at the same time emphasizes the necessity for more careful inquiry into conditions that argue strongly against operating.

A young lady, 20 years old, was referred to me four weeks ago for examination. The right nostril exhibited pus in the middle fossa, which came from the ethmoid cells. Quite a large mass of adenoids occupied mainly the left side of the pharynx vault, and the left tonsil, of medium size, was embedded and the seat of frequent cryptic disturbance.

Attention was first directed to the suppurative ethmoiditis, and by exposure of the cells, after removal of the anterior part of the middle turbinal, followed by irrigation, the purulent process ceased entirely after two weeks. As soon as the nose was entirely free from pus, the adenoids were easily removed under cocaine anesthesia. One week later, the left tonsil was enucleated under cocaine. This dissection was easily and quickly performed so that the entire gland with its investing membrane was secured. As is customary with me in tonsil dissections, I used a small sharp knife, the same spud-shaped knife used in the submucous resection of the nasal septum, a curved pair of scissors and a pair of tenacula spring blade forceps. The dissection was easily carried out between the fibrous capsule of the gland and the tonsilar fossa, but I took notice of an arterial oozing that occurred shortly after the apex of the gland had been liberated, and contrary to what is customary in such dissections, this oozing was prominent throughout the remainder of the operation. The gland was then quickly removed in its entirety and there followed the customary increased amount of bleeding for a few minutes, but this soon subsided to a general oozing. On inspection a clot was seen occupying the entire fossa, but around the clot the bright red blood continued to ooze. At first ice water was held in the mouth and then ice itself was used. After half an hour the clot was removed in order to thoroughly inspect the operated surfaces for the source of the bleeding, but even though a good view of the entire fossa could be obtained, there was nothing to be seen excepting the oozing from all surfaces. Various well-known styptics were used and held firmly applied for several minutes, but with no benefit. The use of ice was continued for two hours. In the interim, two hypodermic injections of ergone, (P. D. & Co.) 30 minums each, were given at an interval of 30 minutes, but the bleeding was increasing in place of diminishing.

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*Read before the Chicago Laryngological and Otologgical Society, October 8, 1907. For discussion see The Laryngoscope, December 1907. page 971.

After two hours had passed and every effort used to control the hemorrhage had failed, I felt it timely to resort to some more radical measure and thereupon applied a Stoerck-Miculicz tonsil hemostat, the pad of which was wet with adrenalin chloride. Very firm pressure was necessary in order to check the bleeding entirely. The patient was then moved to the hospital for better observation during the night. After leaving the hemostat in place for two hours, I very carefully removed it and inspection could discover no further bleeding at any point.

At first I was at a loss to understand the cause of such free and continuous bleeding, but the volunteered statement of the patient during the height of the hemorrhage explained away all doubt in my mind why we had this alarming and annoying complication. She was in the second day of her menstruation.

I invariably avoid operating on tonsils or adenoids under three conditions ;an acute inflammation, during menstruation or advanced pregnancy and in the hemophilic. As I had operated on this patient both in her nose and for the removal of adenoids, I dismissed the hemophilic condition, and as she was free from any acute inflammatory process, I overlooked inquiring into the menstrual condition.

A severe hemorrhage at this time in the life of a young woman is a serious matter, because the reactionary shock on the whole nervous system, and especially upon the procreative organs may have a far-reaching effect upon her future welfare. I believe cases of this kind should urge us to exercise the greatest caution so as to avoid operating on tonsils and adenoids if possible during or just prior to the menstrual period.

100 State Street.

A CASE OF UNCHANGED BOY'S VOICE IN A MAN WHICH WAS MADE NORMAL BY SINGING EXERCISES.

BY W. L. HOLT, M. D., PHILADELPHIA.

The following remarkable "cure" was performed by Miss Groff, a well-known singing teacher of Philadelphia, living at 222 North 13th st. The patient, Clarence R. was recommended to her with an "unchanged," that is undeveloped, boy's voice. He had a good-sized larynx, was well-developed physically in every way, and sexually normal. At the age of twelve he had a fine soprano voice. Then he had scarlet fever, and although he suffered no paralysis of the vocal cords, his voice never developed at puberty, and when he came to Miss Groff, at the age of twenty-six, he spoke like a boy and could sing only in the treble clef. It is interesting to note that he was a very good pianist but extremely shy because of his abnormal voice.

The year before he had consulted two famous throat specialists in Berlin, and they pronounced his case hopeless after treating him with electricity in vain. They could find no organic defect in the vocal mechanism, however.

Miss Groff based her treatment on her theory of voice-production, and the result she thinks tends to confirm her theory. It is in brief that the voice is produced not by the vibration of the vocal cords, but by that of a column of air contained in the cup-shaped cavity of the larynx between the false and the true ventricular bands. She declares that the true vocal bands act as do a man's lips in playing a horn, to regulate the pitch, and that in a man the upper bands have two positions; a lower one which shortens the air column for high notes and an upper one which lengthens it for low ones. The proper adjustment of these "false" bands is as essential in voice production as that of the true.

However that may be, Miss Groff gave him special singing exercises, laying stress on proper breathing and vigorous use of the lungs. After six weeks of such exercises he spoke one day in a normal man's voice, and although before he could sing only soprano and speak only in a childish treble, he then suddenly began to sing bass. Having once "found his voice," he has never lost it, and now, a year later, sings a good low bass and speaks in a normal man's voice.

Needless to say, the world is a thousand-fold brighter to him.

Miss Groff cites this "cure" in confirmation of her theory, explaining the result by supposing that her pupil so increased the force of the air column that it pressed the false bands upward into the proper position for low tones.

Was not development and training of the laryngeal muscles by the singing exercises also probably a large factor in the happy outcome?

Children's Hospital.

Laryngofissure for Papillomata. Prof. G. FERRERI, DE ROME. *Rev. Heb. de Laryngol. d'Otol. et de Rhinol.*, May 25, 1907.

In January, 1903, the patient, a woman of 52 years, commenced to suffer from her throat, the voice becoming more and more feeble. In August, a large number of papillomata were removed by the endolaryngeal route. The voice, however, began to fail again, and soon there was complete aphonia and attacks of suffocation.

In May, 1905, a laryngofissure was made after a preliminary tracheotomy. A large mass of papillomata was removed, the origin of the neoplasms being in the ventricle of Morgagni. The canula was removed on the 10th day, the case resulting in a permanent cure.

According to the author, laryngofissure is preferable to intervention through the natural passages. Especially is it a more practicable operation for children. Should the papilloma prove to be the initial stage of the development of cancer, the opening of the larynx permits the entire extirpation of the neoplasm.

SCHEPPEGRELL.

A NEW NASAL SEPTAL FORCEPS.

BY SAM GOLDSTEIN, A. B. M. D., NEW YORK CITY.

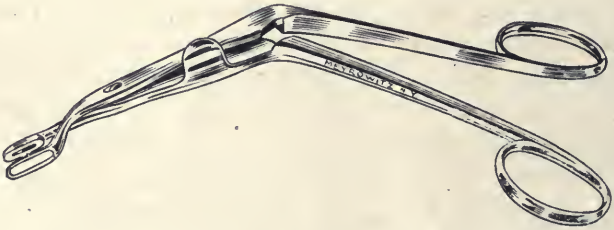
The submucous operation has undoubtedly, in properly selected cases, been given a permanent place among the number of measures (if it has not altogether superseded all others) adopted for relief of the various deformities of the nasal septum. Whatever doubt may have appeared concerning its efficiency over all other previously accepted methods of operative procedure, when first placed before the surgeon for his endorsement, has most assuredly been dispelled in the face of the universal acknowledgment given this pronounced advancement in technique in nasal surgery.

The only divergence of opinion that might arise at the present day could be the operator's own preference of detail in method or choice of anaesthesia, and instruments employed, or amount of tissue to be removed in the individual case. As these methods are more and more clearly demonstrated, so in proportion is our knowledge and skill enhanced in this particular line of nasal surgery.

At the inception of this operation the instruments designed for our use were few, and although undoubtedly of value at that time, were later found to be inadequate for all of the varieties of nasal septal deformities. As was but natural under the circumstances, many and varied are the new and likewise modified instruments regularly appearing, many of them of undoubted and proven efficiency, almost indispensable to some of us in this work, others equally useful, perhaps, to the inventors thereof, but hardly to be recommended for the general operator, especially the beginner, in this field.

For a considerable length of time we have been seeking a good working instrument that could be universally and safely employed for removing any manner of deformed vomer or maxillary ridge that so often complicates septal deflections and dislocations. Varied styles of knives, forceps, gouges and chisels have been recommended by operators for the removal of this deformity, occurring so frequently and undoubtedly requiring the most immediate attention. Up to the time of perfecting the model of this forceps, that is now presented for approval, we had not found an instrument that could be so readily or safely employed for the removal of any or all of the maxillary ridge deformities so commonly encountered. From the very nature of the septal deformity, occurring at or near the nasal floor, and projecting so far posteriorly at times to present the real septal difficulty, by its interference in nasal respiration, its complete removal was the real problem that confronted and so often puzzled us.

The solution of this problem meant to us the production of a forceps so constructed that after all of the deflected cartilage which could be removed without endangering the stability of the septum was accomplished, the deformed portion of the perpendicular plate of the ethmoid, if so presenting, disposed of, we should have an instrument ready for use that with the least loss of time, now so valuable as we are approaching the final stages of the operation, which could be introduced simply, grasp the deformed vomer at the maxillary ridge, bite through, and permit of its immediate and safe removal.



Such an instrument, judging from our experience with the same, is now presented in the hope that it will fill an hitherto present void. Although this forceps was purposely designed for attacking the maxillary ridge, we have since found that it can be more generally employed, viz., in removing cartilage not included in the sweep of the Ballenger swivel knife; in removing deflected portions of the perpendicular plate of the ethmoid bone and exostoses on the floor of the nose; with further experience perhaps other uses in nasal surgery may also be found for this instrument.

The forceps is purposely very strongly fashioned and provides for a good clean even bite of such bone and cartilage as may be deemed necessary for removal from the nares.

The bends or curves in the blades of the forceps were so designed to not only preclude any chance of the surgeon's hand interfering with his vision of the nasal field while operating, but to allow, as well, as full a dip of the jaws of the instrument as required to include the lowest possibly placed septal deformity that might be encountered.

The jaws of this forceps also permit of a sufficiently large bite of the parts regarded as requisite for removal; thus, by avoiding its too frequent introduction, unnecessary injury to the septal mucosa is prevented.

The forceps consists of two pieces joined by a screw lock, about one-third of the distance from the cutting parts; the Collin flap at the distal end affords additional strength to the instrument.

The ring handles are bent downward at an angle of about 45 degrees from the body of the forceps, and open parallel with the cutting jaws, one of which is fenestrated.

The jaws resemble somewhat the shape of an "S," and are bent downward about three-eighths of an inch from the body of the instrument.

For patience in the production of numerous models, and for his valuable assistance, my thanks are due to Mr. I. S. Goldstein, of the Surgical Instrument Department of E. B. Meyrowitz, of this city.

1335 Madison Ave.

The Bier Treatment in Otology. LEUTERT. *Deutsche med. Wchnschr.*, Aug. 1, 1907.

After a review of the literature and of his own experience, the author takes the following standpoints:

(1) The Bier treatment is useless in chronic otorrhoea.

(2) Its use is dangerous in mastoid suppuration on account of the proximity of the sigmoid sinus.

(3) Its value has not been demonstrated in severe forms of acute suppuration as in those following scarlet fever and measles, and its employment in these cases must be undertaken with great circumspection.

(4) The results in recent mild cases are not conclusive.

(5) In early mild cases paracentesis relieves the pain and fever in shorter time.

YANKAUER.

A NEW PROCEDURE FOR THE CORRECTION OF THE SADDLE NOSE.

BY F. E. WAXHAM, M. D., DENVER, COLO.

While the injection of paraffine for the correction of this unsightly condition has had many advocates, yet many have abandoned it on account of accidents and unfortunate results. It requires much pressure to raise the sunken tissues to the proper elevation and as the paraffine under this pressure, will seek the areas of least resistance, it will often spread, in spite of all precautions, to the end of the nose, the cheeks, or about the eyes. Under this great pressure the danger of embolism is also great.

Among the many objections to paraffine prothesis the following have been enumerated by Gleason as among the more important. Infection followed by sloughing or abscess. Pressure necrosis from injecting too much paraffine. Deformity from hyperinjection or from spreading into the wrong place. Embolism from the injection of paraffine in a too liquid state and to these may be added pressure necrosis, from too great pressure, in the effort to elevate tissues too deeply sunken or bound down by adhesions.

All of these dangers I believe can be obviated; the danger from embolism, by injecting paraffine in a semi-solid state and by avoiding too great pressure; the danger from infection, by proper sterilization, and perfect asepsis; the danger from pressure necrosis by care in not injecting too great a quantity of paraffine. The danger from spreading of the paraffine into undesirable locations as well as from pressure necrosis can be avoided by a new proceedure. It consists in making an incision through the skin at the root of the nose, separating the tissues with the curved scissors or spud, such as is used in the submucous resection of the septum, carefully raising and stretching the skin and subcutaneous tissues with an elevator. A warm sterilized solution of adrenalin (one to three thousand) is now introduced through the incision and between the separated tissues and retained for a few minutes. This controls the bleeding, contracts the blood vessels, and thus lessens the danger of embolism. Paraffine at a melting point of 110° to 115° is now injected through a blunt pointed slightly curved needle and deposited at the fartherest portion of the separated tissues. As the needle is gradually withdrawn, more of the paraffine is deposited. Only slight pressure is required, simply a sufficient amount to elevate the already separated tissues. To prevent the return of the paraffine through the incision, firm pressure is made at this point, or the incision may be closed previously with fine sutures.

SOCIETY PROCEEDINGS.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, March 11, 1908.

A. H. ANDREWS, M. D., PRESIDENT.

PRESENTATION OF CASES.

Cyst of the Epiglottis. By JOS. C. BECK, M. D.

Dr. Beck presented a child, who, when first seen, was cyanotic, spoke with difficulty and presented all the symptoms of a laryngeal obstruction, a condition which was said to have existed since birth. A tumor was palpable in the region of the epiglottis. A laryngoscopic examination was impossible. A puncture of the tumor yielding nothing. A tracheotomy gave relief from the distressing respiratory symptoms. On incising the tumor, a gelatinous, greyish fluid was evacuated. The cyst led into the fossa pyriformis and was attached to the epiglottis. A cautery point was passed into the cyst cavity and it was cauterized thoroughly. The child improved and made a good recovery. Speech is normal. At the site of the tumor is an infiltrated mass.

Excision of the Jugular Bulb. By JOS. C. BECK, M. D.

This patient had typical sinus thrombosis, with 40,000 leucocytes and symptoms of thrombosis of jugular vein, extending down to the level of the thyroid cartilage. The sinus was excised to midway between the torcular and transverse sinus, to back of the mastoid, and down to the formation of the jugular bulb after the method of Alexander.

DISCUSSION ON DR. BECK'S CASES.

DR. GEORGE E. SHAMBAUGH:—These cases of thrombosis of the bulb of the jugular present one of the most difficult problems in the surgery of the temporal bone. It may be difficult in the first place to determine in which cases one is justified in interfering with a thrombus in the bulb, and in the second place the operation required to expose and clean out the jugular bulb, may in certain cases present almost unsurmountable difficulties on account of the high position of the bulb. I have some preparations where for example the upward bulging of the dome of the jugular bulb extends through the superior wall of the petrous portion of the temporal bone. In such cases the exposure and complete cleaning out of the bulb necessitates an operation so extensive that in itself it may be much more formidable than the danger from the thrombus.

The mere presence of a thrombus in the jugular bulb is not in itself sufficient reason for the undertaking of an operation that is always difficult, and may be quite formidable. Whether the thrombus in this locality ought to be removed should depend upon whether it is infected or not infected. If it can be determined at the time of the primary operation on the lateral sinus that the thrombus in the bulb is an infected one, that is, if a foul-smelling, broken-down thrombus extends up toward the jugular bulb, I believe we are justified in carrying on the operation so as to expose and clean out the bulb. If on the other hand a firm and to outward appearance non-infected thrombus is found extending into the bulb of the jugular, I believe the conservative altitude is the correct one, for should it turn out that the thrombus is as it appeared to be, not infected, experience has shown that the patient is quite safe with the thrombus left alone, and in this way many of these cases can be spared the dangers of a difficult operation. On the other hand, should it turn out that in spite of its normal appearance, the thrombus in the bulb is an infected one, which is also possible though perhaps not probable, then the subsequent history will show a continuation of the septic temperature curve and under such circumstances one is again justified in undertaking the operation on the bulb. In that way alone unnecessary operations can be avoided.

The anatomical variations in the position of the jugular bulb are the most striking. In some cases the bulb is so slightly developed that it can be readily cleaned out by extending a curette forward along the course of the sinus. I have a number of preparations where the dome of the bulb produced a marked bulging in the floor of the tympanum, and in these cases the bulb could be easily opened and cleaned out from this locality, as has sometimes been recommended. The operation that seems to make it possible always to reach the bulb and effect its exposure is the operation recommended of chiseling away that portion of the temporal bone lying along the anterior margin of the forward extension of the sinus until the bulb is reached. The two dangers in this operation appear to be in the first place, the injuring of the posterior semicircular canal if we chisel too high, and the cutting off of the facial nerve if too thick a piece of bone is taken off in front of the sinus.

Dr. Frank Allport:—If the thrombus extends back in the direction of the torcular and is solid, many surgeons believe it is the best policy to do very little with it. Accretions to the thrombus extending a considerable distance beyond the original seat of infection may be reasonably supposed to be innocent in their character, and may perhaps be safely left alone. Of course, that portion of the thrombus situated near the seat of infection should be curetted and all thrombotic material sufficiently removed in the direction of the torcular to do away with all infective thrombotic material. That portion of the thrombus extending down toward the bulb is, of course, usually infective in its character and can easily be carried by the blood current down into the jugular bulb, internal jugular vein and into the general circulation, thus producing sepsis, pyemia, metastatic foci, etc. This portion of the thrombus should then be completely removed. If an organized clot is found in this portion of the sinus I believe the interests of the patient can be best conserved by packing the sinus wound and immediately proceeding to a complete exposure and removal of the internal jugular vein. After this has been accomplished and the danger of loose, cast off and infective thrombotic materials are in no practical danger of being thrown into the general circulation, we can then go back and complete our operation upon the lower portion of the sigmoid sinus and jugular bulb. I believe that the jugular bulb can be thoroughly cleaned in this way without making use of the Alexander operation, but I am under the impression that the Alexander operation is not being performed much by surgeons doing this character of work. Notwithstanding this, I am glad that Dr. Beck is experimenting with it and that he has given us the honest results of his timely investigations.

Dr. A. H. Andrews:—I recall a number of cases in which I cleaned out the lateral sinus as best I could with a curved curet, ligated the jugular and cut it off back where it was necessary to check hemorrhage and the patients got well. I felt sure that had I undertaken to clean out the jugular bulb, the patients would not have stood anywhere near the chance of recovery that they would without that formidable procedure.

Dr. Beck, closing: I do not believe in leaving an infectious area anywhere near the field of operation, especially when it can be reached. At least the attempt should be made; when it is anatomically and surgically possible to remove it. When the clot is infected, it should be taken out; if not, it should be left alone. Free bleeding should be obtained behind as well as below; then you are sure that all of the thrombus has been removed. Puncture and drainage of the bulb through the middle ear is possible but should not be advised as a routine procedure.

Tabes with Laryngeal Crises. By OTTO T. FREER, M. D.

DR. FREER presented a patient with tabetic laryngeal crises and paresis of the abductors of the vocal cords, also due to tabes. His report was supplemented by Dr. Stanton R. Friedberg, who had observed the patient in his service at Cook County Hospital. The attacks of crisis varied in frequency from several times a day to once in a few days, and were usually introduced by an aura consisting of abnormal sensations and tickling in the throat. The aura was followed by spasmodic closure of the glottis and a suffocative spell which completely shut off the patient's breath and voice for a period of from one-half to three-quarters of a minute. The spasm of the glottis then relaxed enough to permit labored breathing with stridor, the onset terminating in a coughing spell. Physical examination by the neurologist, Dr. William Healy, showed enough of the signs of tabes to prove its existence beyond doubt, inco-ordination of both upper and lower extremities, Argyll-Robertson pupil, Romberg's symptom and other positive signs being found present.

Laryngeal inspection showed permanent partial adduction of the cords, which did not move outward even during deep inspiration. During quiet breathing they remained abnormally approximated, these conditions were regarded as due to paralysis of the crico-arytænoidei postici muscles.

Dr. Freer, in his comments referred to Sir Felix Semon's classic section on the nervous diseases of the larynx in Heymann's Handbuch der Laryngologie and the great influence it had had in stimulating research in the neurology of the larynx. He regretted that no English version of this superb work of Semon existed. The history of the patient was compared with Semon's description of the crises of tabes and found to be in accord with it, including the paralytic state of the abductors of the cords mentioned by Semon as frequent accompaniments of tabetic laryngeal crises.

Dr. Freer referred to the prevailing impression, gained from the brief articles of textbooks, that paralysis of the crico-arytaenoideus posticus muscle is immediately followed by permanent adduction of the cord to the median line, that is, the centre of the glottis. He explained that this impression is incorrect and that the only evidence of posticus paralysis, especially in tabes, may for a long time be a slowly developing loss of the faculty of abduction of the cord into the inspiratory position, coinciding with the gradual loss of power of the abductor muscle to finally a state of complete paralysis. Only later, as spastic contracture of the unantagonized adductors develops, is the cord gradually drawn towards the median line, which may never be reached by it, in so slowly progressing an affection as tabes, before the patient dies.

DISCUSSION.

DR. WILLIAM HEALY: This case illustrates the fact that tabes is not only, as the text books say, a disease of the sensory neurone, but also partakes of motor qualities. Perhaps it is worth while to present to you a few figures on the frequency of these laryngeal motor symptoms in tabes. Dr. Harland presented before your Laryngeal Section last year a paper based on his examination of thirty cases of tabes in which he found no instances of crisis or paralysis of the intrinsic muscles, and therefrom drew the conclusion that such symptoms are inordinately rare. As far as my own experience is concerned, I presume that I have seen about two hundred cases of tabes and I must confess that this is the first case with well-marked laryngeal crisis that I have seen. I have looked up the matter somewhat in the literature and have found recorded some 1,270 cases that have been trustworthily examined, and of these four per cent had laryngeal crises. The figures vary, of course, according to different observers; for instance, Starr in 450 cases saw only two per cent, while Graeffner saw ten per cent of crises in 251 cases.

The relationship to the frequency of other crises is a matter of some interest, the most frequent being gastric crises. According to different observers again we find that gastric crises are from five to fifteen times more frequent than laryngeal crises, although the latter are the most frequent next to the stomach trouble. Other crises still more rare are intestinal, rectal, bladder, renal, urethal, testicular, cardiac (simulating angina pectoris), and crises of the clitoris.

The frequency of paralysis of intrinsic muscles of the larynx varies from fourteen to twenty-six per cent of all cases of tabes. The abductors are nearly always affected first, the side affected varying, but the left side being oftenest affected. Gerhardt reports eleven cases of posticus paralysis, five bilateral and three cases in which all the muscles supplied by the recurrent laryngeal nerve are affected. The paralysis may appear in the very early stage, the preataxic. Semon saw a case in which for two years it was the only symptom of tabes. However, it may not appear until later.

Oppenheim discovered a curious sign, namely, that pressing on the sides of the hyoid bone frequently brings on an attack of laryngeal crises in patients subject to it. Most authors maintain that practically always the Nucleus ambiguous of the eleventh and tenth nerves is affected, but others have not found this to be true; finding the degeneration, rather, in the root fibers running out through the medulla or in the vagus nerve itself. Oppenheim saw one case in which the muscles showed degeneration and none of the nerve fibers nor the nucleus.

The prognosis of the laryngeal troubles of tabes is very bad; rarely paralysis may necessitate an operation. Semon points out that in time paralysis of the adductors takes place and the patient then, with both sets of muscles out of commission, is relieved of all further trouble. He also points out that an operation in such cases is rather dangerous on account of the trophic disturbances which frequently take place in tabes, and he has seen sloughing and failure of the wound to heal after trachectomy. The treatment generally recommended for crises is painting the larynx with a strong solution of cocain and giving bromids and codein internally.

Dr. J. Holinger: Some authors claim that the treatment of syphilis is responsible for tabes. I would like to ask whether there was a history of syphilis in this case, and what the treatment was; whether there is any connection between these two, the syphilis and the tabes.

Dr. Freer: There was no history of syphilis in this case and a careful examination failed to reveal any evidence of syphilis. The lesson to be learned from the case is that laryngologists may be called on to discover nervous diseases through evidences in the larynx, and that all the work done on the innervation of the larynx is German.

Subjective Sensations of Smell and Their Significance. By H. Kahn, M. D.

DISCUSSION.

Dr. W. L. Ballenger: I think that many of the cases reported are not cases of parosmia, inasmuch as the patients had a stinking substance in the nose which they smelled. Parosmia is a hallucination of smell and not smelling foul secretions in the nose. In antrum suppurations very foul odors are perceived.

Dr. Holinger: I wish to call attention to the fact that not all cases of parosmia have an organic basis. The usual symptom of a coryza is parosmia. If in such cases the sinuses would be examined carefully, some hint as to the cause of the trouble would be discovered.

Dr. William Healy: Beginning with the work of Hughlings Jackson on the uncinate gyrus, neurologists have been especially interested in abnormalities of the sense of smell. An important point is the relation of such abnormalities to epilepsy. Perhaps the physiology can best be explained in the following way. If a minimal electric stimulation is given certain cortical cells in the motor region of the brain, contraction of the muscles supplied from that region will take place, but if a larger current is passed through the electrode the stimulation irradiates from this spot and causes contraction of a greater area of musculature, and with a still greater current a generalized fit may take place on one side of the body and even spread over to the opposite half. Now there has been described a class of fits, the so-called uncinate fits, in which the aura is that of the sense of smell, and it seems probable that the original source of irritation is in the uncinate gyrus and that the overflowing stimulus which causes a generalized fit originates from this source. It is also suggested that many of the so-called hysterical symptoms of the nature of parosmia that Dr. Kahn has just been talking about, may be due to some organic irritation of the uncinate gyrus. On account of what he has just said I would like to send the doctor one of my patients who corresponds somewhat to his description of some cases he has benefitted, and who also corresponds to a very definite type which neurologists frequently see. It is a young woman who thinks that she constantly perceives an odor which she is sure emanates from her body. She has been treated vigorously by a number of good men, especially having had the gastrointestinal tract thoroughly treated. Lately she has been having her nose looked after, but the point that I want to make particularly is that together with her preception, or fancied perception of an odor, she has a complete line of ideas of persecution which altogether makes up a nice picture of paranoia. Now I think that back of it all there may possibly be some organic disease directly connected with the olfactory organs which accounts for her original beliefs.

Dr. Kahn: I gave a clinical classification in my paper. These are subjective symptoms, and if objective proof is found, it becomes an objective symptom. They might be classified as true and pseudo-parosmias; the true being of nervous origin, with no definite organic change, and the pseudo, those in which the cause is concealed. In answer to Dr. Holinger, who does not wish to dig around in the sinuses, I will say it is known that parosmia is only found in diseases of the ethmoid sinus and the antrum of Highmore, the sphenoid and frontal sinuses never causing any such symptoms when diseased.

Technic of Adenectomy and a Perfected Curette.. By F. G. Stubbs, M. D.

To be published in full in a subsequent issue of The Laryngoscope..

DISCUSSION.

Dr. E. Pynchon: I wish to endorse the angle in which the cutting blade is placed. It is the only natural angle whereby one can curette the entire vault. The only criticism that can be made is that the blade is in a straight line. The pharyngeal vault is high and arched, and putting a straight line across it does not enable one to touch all of the surfaces which are rounded; therefore, the blade should be curved. The vault also gets smaller toward the top, hence a straight knife cannot go clear up to the top.

Some ten years ago I designed an adenoid curette, the upper cutting blade of which was placed at the same angle employed by Dr. Stubbs. This upper blade was also curved for the reasons given. Furthermore, this curette was provided with side cutting blades, so the fossae of Rosenmueller could be curetted. It was made for me by Truax, Greene & Co., and its description was published in the Annals of Otology, Rhinology and Laryngology, February, 1900.

Dr. W. L. Ballenger: I wish to call attention to the anomalous formations of the pharyngeal vault, and it is obvious that not many curettes will meet all these conditions and remove the tissue. I think that Dr. Stubbs' curette is one of the best, but the curette Dr. Pynchon designed some years ago with a backward sweep of the blade would be successful where Dr. Stubbs' curette would fail.

Dr. Henry Gradle: I think that the curette is correctly designed and that it is applicable to the slight variations of the pharynx met with in practice, and that with moderate skill and some practice the mass can be brought out in one piece with one sweep. But it presupposes some practice and skill, and to minimize that I designed the automatic guillotine. It is very similar in curve and form to the Stubbs' curette. The knife of the guillotine does break once in a while, but only in one place; but all that is necessary is to put in a new knife. The particular advantage of the guillotine is that it adapts itself automatically to the shape of the pharynx, and if the operator remembers to push it up firmly enough, sliding along the posterior edge of the vomer, he cannot fail to bring out the mass, even with little skill. But with more skill, Dr. Stubbs' curette will accomplish the same purpose as thoroughly and as satisfactorily.

Dr. Jos. C. Beck: I use the Barnhill curette and have no trouble in getting out the adenoids in one mass. One might have trouble with Dr. Stubbs' curette in cases where there is a deformity of the wall of the pharynx or a protusion of the atlas, and extreme care would have to be used in making the forward and upward sweep not to cut the mucous membrane. The greatest trouble the average practitioner has is to sweep downward. I have modified the guillotine by making the blade work upward, thus preventing a breakage. I use a solid blade, devised by La Force, and it does the work very nicely.

Dr. F. G. Stubbs, closing: It is true that no single instrument can be made that will fit all cases, but I believe that this one will in the great majority. The reason that I made the knife blade nearly straight on its upper surface was that I found it would gouge too deeply in the median line, in many cases, if it had much curve.

What Dr. Gradle claims for his adenotome is true, yet it also is true that it cannot adapt itself to varying shapes of the vault as can the curette. Further, as one should use as large an instrument as will fit into the vault, at least three sizes are needed and this makes a very expensive outfit.

Replying to Dr. Beck, I would say that my curette differs from Dr. Barnhill's in that the supporting sides recede directly from the knife, while the knife is straighter, flatter and much narrower, apparently small differences and yet essential to a complete removal. And this complete removal should be done with only one sweep of the curette.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

Twenty-ninth Annual Congress. Washington, D.C., May 7 to 9, 1907.

A. W. DeRoaldes, M. D., President.

(*Continued from the April Number, page* 334.)

DISCUSSION OF DR. GOODALE'S PAPER (CONT.)

Dr. John W. Mackenzie: Dr. Austin Flint was once conducting an examination in physiology, and asked one of the men that came up to be examined: "What is the function of the spleen?" He replied: "The function of the spleen is to enlarge in malarial fever." The next student was asked: "What is the function of the tonsil?" He said: "To enlarge and suppurate." Dr. Flint said: "You have a perfect mark, for you know as much about it as I do." A distinguished medical luminary across the Atlantic once said that if he were going to construct a Frankenstein, he would make it without the tonsils. At a meeting in New York, a distinguished ex-President of this Association reported a number of cases of tonsillotomy; and some inquisitive, incredulous individual, with a mathematical turn of mind, calculated that he must have taken out a bushel a day to have done so many in an ordinary lifetime.

This general massacre of the tonsils that obtained in the early days of laryngology received a rude jolt when, in the early part of the last century, it was proclaimed that the tonsil had a direct relation to the virility of the male. This luminous doctrine owed its popularity to Chassaignac. According to this proposition, impairment of the tonsil or its extirpation produced impairment of the sexual function. This made the excision of the organ unpopular. When it had been found out that there was nothing in this theory, the work of massacre of the tonsils went merrily on again. Never in the history of mankind has the lust for tonsil operation reached its zenith, however, until now. Not only the profession, but even the laity, are infected with the idea. I frequently have patients say, before I have even looked at their throats: "Doctor, don't you think my tonsils should be removed?"

On the other hand, I was consulted a few weeks ago, by a lady past middle age, who had some concretions in the crypts of one of the tonsils. She did not wait for me to give an opinion, but said:

"I want it distinctly understood in the beginning, that my tonsils are not coming out. I have carried them for sixty odd years; and, though they have given me trouble at times, they have not interfered with my general health, and I mean to keep them." I replied: "Madam, the logic of your position is irresistible, and I will respect your wishes."

In regard to the question of the tonsils as portals of inspection, of course there is no denying the fact that they are very frequently the avenues by which acute arthritis or acute endocarditis and other diseases enter the system; but the subject has been very much exaggerated. It is curious to note historically that the relation of tonsilitis and acute inflammatory infections of the throat and the nasal passages to rheumatism has been recognized since early times. Pliny repeatedly uses the terms fluxor and rheumor as synonymous. The association between these two sets of phenomena has engaged the attention of such men as Hoffmann, Venable, Curtis, Sydenham, etc. Kauffman regarded catarrh as rheumatism of the mucous membrane.

I am thoroughly delighted with the beautiful work of Dr. Goodale. He has pointed out with great lucidity the purely bacteriological side of the question. There is another side, however; the purely clinical one. If we follow the pure bacteriologist to the extreme limit, there is no telling where we shall be landed. When we consider that the tonsillar region and naso-pharynx is the lounging-place, the club-house, of pathogenic bacteria, why do we not have more sepsis in the thousands of cases in which operations have been performed on this region? It therefore seems to me that if we follow this proposition to its logical end, nothing short of the guillotine will give the patient absolute immunity.

From the purely clinical standpoint, I think that these total tonsillotomies are absolutely unnecessary and frequently harmful. It is a question whether the shock and danger, and the inconvenience and uncertainty, of the method of complete tonsillotomy, the chief objection to which is that it cannot be made complete, do not nullify any good that may be expected to arise from it. When the bad result and the accidents met with in this operation are contrasted with the amount of exact, certain good accomplished, I doubt whether, in a great many cases, one is justified in undertaking such extensive work.

Let us not be misunderstood. I have been taking tonsils out for a quarter of a century, and hope to do so for many years to come. My contention is simply this: In considering these operations, one should be guided by a safe, sane, conservatism and common sense, and not be carried away by those that, by their precepts and example, would have us believe that the tonsil was not put into the throat by God, but by the Devil.

Dr. Goodale, closing the discussion: I wish to say that examination of the faucial structure of cattle and of ordinary swine, shows the presence of an aggregation of lymphoid elements, not different from the structures that we find in normal children. When children come to us for the removal of adenoids, we remove the tonsils in order to prevent the subsequent occurrence of enlargement of the tonsils, and to make the operation more complete. Examination of these normal tonsils shows that they are indistinguishable from the tonsils of the pig. The pig resembles the human animal more nearly than does any other in the histological structure of its different tissues. A study of the human animal shows that shortly after birth there is an invagination of the epithelium. This may be found in every individual, so far as I know. Around that invagination there gather the follicles. These are aggregations of lymphoid cells. As the child increases in size, the crypts of the tonsils are formed. These are present in a normal child three or four years old. I cannot, therefore, agree with Dr. Bosworth that the tonsil is not a normal structure of a normal human body. When it is enlarged, this is caused by the absorption of toxins or the penetration of toxins formed in other situations; as in scarlet fever, mumps, typhoid fever, etc. The reason that a normal tonsil reaches a condition of hypertrophy is that various toxins—formed either in the throat, from bad condition of the teeth, etc., or as the result of a more general distribution of toxins throughout the body—penetrate its substance.

Dr. Casselberry spoke of the importance that the chain of lymph-follicles behind the posterior pillar has in infectious arthritis. That is a point that has recently become more conspicuous in my mind. I shall probably speak more about it in the future. In our examinations of the throats of patients, we always find a certain number presenting this common hypertrophy of the posterior chain. If one asks such a patient whether he has had rheumatism, he will probably say, "Yes." An examination made during an acute attack of arthritis will show either enlargement of the tonsils or enlargement of the bronchial follicles, with inflammation.

In regard to total extirpation of the tonsils, I think that if one is willing to do a very thorough operation, the tonsils can be entirely removed. This cannot, however, be done well with cutting instruments. The only safe procedure for these deeply buried tonsils is first to remove what can be gotten out of that portion which protrudes into the mouth; and then, with a deep holder of some sort, to get into the interior of the tonsil until the capsule is reached. Then seize the capsule and invert the whole thing, first freeing it from the pillars with whatever instrument you wish. My experience has shown that the only way to remove deeply buried tonsils is to seize the capsule. After it has once been everted, it is surprising to see what a shape it assumes. Let the snare then fall over your original holder, and repeat the process of eversion. After this has been done, lock the snare and cut the thing down. Careful examination of the capsule will now show a complete excision.

This is a serious operation. There are few patients upon whom I should wish to do it. There is a great deal of soreness for two or three weeks after it has been done.

This brings us to a consideration of the circumstances in which it is necessary. Operations on the tonsils should be done for two purposes: For obstruction, when the tonsil interferes with the circulation in the vicinity, or has an unfavorable influence upon the Eustachian tube; and for absorption. The methods in each of these conditions are distinct. In operating upon a child for obstruction, one can content one's self with doing a simple operation; and when the child reaches the age of puberty, there will be involution of the remaining portion. That is the ordinary operation. There are relatively few cases in which complete tonsillotomy should be done. These may be grouped, more particularly, under the conditions of infectious arthritis, recurrent endocarditis, and infection of the cervical lymph-glands. The first two of these conditions may be very serious menaces to the individual. It may be a question whether he will die, or be an invalid for his remaining years. With proper treatment, he may be made comfortable for many years to come. With these I shall group a third condition of cervical adenitis, supposed to be from tuberculosis. Cervical adenitis may be the result of toxins generated in the crypts of the tonsil. In this condition, the diagnosis is confirmed if, after removal, the swelling goes down. The other cases are penetration of tubercle bacilli into the tonsil through the glands of the neck. In such cases, removal of the tonsil will not influence the glands. What should be done in these conditions? A direct answer to that question is found in our results. If a child were brought to me with enlargement of the glands of the neck, I should recommend the complete excision of the tonsils before doing anything to the gland, unless the glands were in danger of breaking down. If the organisms have only made their way through the crypts of the tonsil into the glands of the neck, and you merely remove the glands, what is to prevent the production of fresh infection? Remove the tonsils as completely as possible; then either do the operation on the glands yourself, or turn the case over to the general surgeon.

Demonstration of New Instruments for Bronchoscopy and Oesophagoscopy. By Prof. Gustav Killian.

Five new tubes were shown, varying more in length than the older models, being both longer and shorter. A tube spatula, through which a smaller inner tube could be introduced or removed easily made it possible to substitute tubes of longer or shorter length without repeating the difficult first stage of introducing the tube.

New tubular forceps, being adjustable to varying lengths of tubes, and a new lamp firmly attached to the handle of the tube, were presented and explained.

DISCUSSION.

Dr. H. P. Mosher: I cannot express how fortunate I think the society is in seeing these instruments. I have had a fairly extended chance to work with them, and two points occur to me that I should like to have Prof. Killian clear up; I hope the elucidation of them will not prove tiresome to you.

He said that the nearer one gets to the foreign body with the tube, the better will be the result. Why not say, "The nearer one gets to the foreign body with the light?" I used to work with the light at the end of the tube, as near to the foreign body as it could be brought. Why has this been given up? So far as I can tell, especially from work on the cadaver, the light at the end of the tube, in the form of the endoscope, gives much better results than does the light on the forehead, or the light as demonstrated.

As to the extension tubes, that is an extremely beautiful idea mechanically. I noticed the other day that Prof. Killian had to put his suction tube inside the main tube to remove the mucus. With the plain, straight, solid tube, with a light at the end and a smaller tube set into the side of this tube to remove the mucus, it is not necessary to introduce a tube for this purpose. The tube made by Jackson admits of withdrawing the mucus while operating, and thus saves time.

Thirdly, it is of great importance to know how many cases require an emergency tracheotomy after the manipulation of passing tubes through the cords. If we could all do the operation as Prof. Killian did it in New York; there would be little call for an emergency tracheotomy, but we cannot do that. I am afraid that in our first attempts we shall cause a certain amount of trauma; and if we do so, we are running the danger of emergency tracheotomies. There have been some necessary in this country; have there been any in the German clinics?

DR. E. FLETCHER INGALS: I wish to ask how the forceps is taken apart. I have had a good deal of trouble in this way.

Referring to what the last speaker said about the advantage of having the light at the end of the tube, I would state that in my practice, the light is sometimes better at the distal end, and sometimes at the proximal. I have in mind one case in which the light at the lower part of the tube caused a reflection that appeared like an extra ring. It came from the lower part of the tube. I have never obtained this reflection with the light at the proximal end. It caused a great deal of annoyance, and was probably the reason for the failure in the case. The child had swallowed—or, rather, inhaled—the head of a lead-pencil—a small bit of brass with the lead-pencil in it. I felt that the pencil must have been removed and that what I saw was the brass; and my assistants were still more certain that this was the case. The pencil was there yet, however; but it was in the other bronchus. The reflection has deceived me a great many other times, though it did not result in failure.

The light at the distal end does not always work well, no matter how bright it is. I should think that Dr. Jackson's instrument would cause a good deal of difficulty. The blood or mucus blurs the light, and cannot be cleaned off; and it does not seem practicable to take the tube out and introduce it again. I have used the light within the tube, but not this kind.

As to the suction-tube outside the bronchoscope proper, you want all the room inside that you can get; and the suction-tube outside is only another tube liable to be blocked. Suppose that very thick mucus and blood block it. I have had mine become blocked so that I could not use them at all. They were tubes introduced into the bronchoscope itself. It seems to me that it is better to have an instrument inside that you can withdraw; because the withdrawing is a quick process, and you can work with a larger tube. The larger the tube, the better the lighting; and with little children you cannot get a large tube in. With adults, also, when working beyond the first or second division of the bronchi, one has to use a very small tube.

On the whole, I think Prof. Killian's instruments are as nearly perfect as they could be. The watch-spring would not be in the way, but I should like to know how it is cleaned and oiled.

Dr. E. Mayer: I agree fully with the statements made by Dr. Ingals, that there is an objection to the light at the other end of the tube. Very frequently a small amount of blood will show itself on the mirror, and one has to stop until the mirror has been cleaned off again; especially as we may not be able to see the foreign body so quickly as Prof. Killian could.

The newer instrument is, I think, of very great value, and a great improvement upon the older one, in that the light is held in the hand. The head-mirror becomes hot within a short time and one has to stop and allow the instrument to cool off.

Reference has been made to the cadaver. To work with the cadaver is about as useless a method of practicing bronchoscopy as I know of. It is far better to take a dog. This comes much nearer to the actual work, and is easily done without annoyance to the animal. An injection of a grain of morphia makes it quiet; and the introduction of the instrument into the larynx, trachea, or bronchus becomes an easy matter indeed. One has then the same conditions that exist in the human being—the hot air in the face, the mucus, and the little blood. The newer instrument, in that it is less clumsy, is going to be a valuable addition to our armamentarium in this work. I feel that we owe a great debt to Prof. Killian for the advance in our armamentarium.

Prof. Killian, closing: I think that the questions have all been answered. I have only to say that most of the cases of foreign bodies are in children, whose tubes are very small. The diameter of an electric lamp must be three millimeters at least, and the mirror in the tubes will obstruct most of the tubes in such cases.

I have found 116 cases of tracheotomy after bronchoscopy. In these cases, the extraction was difficult; and it was necessary to have the tube remain a long time in the larynx, and to introduce it several times. Personally, I have never had a case of tracheotomy after laryngoscopy. I am very careful; and the gentlemen, my colleagues, that have seen me do this operation have been assured that I did not make a trauma. If you have a good situation for the instruments, it is not necessary to make a tracheotomy subsequently. This becomes necessary only if it is not possible to remove the foreign body through the larynx. Then tracheotomy must be performed, and also lower bronchoscopy.

DR. MAYER: What age is too young for direct bronchoscopy to be performed?

PROF. KILLIAN: The youngest child upon whom the operation was performed at Munich was eight months old.

Modern Procedures in Excision of Intrinsic Maligant Growths of the Larynx. By SOLIS-COHEN, M. D.

(*Published in full in* THE LARYNGOSCOPE, *May*, 1907, *page* 365.)

Non-Recurrent Carcinoma of the Larynx Removed from the Natural Passages. By E. FLETCHER INGALS, M. D.

(*Published in full in* THE LARYNGOSCOPE, *May*, 1907, *page* 370.)

Report of a Case of Epithelioma of the Larynx. Removal by Thyrotomy and no Recurrence after Three and One-Half Years. By HENRY L. SWAIN, M. D.

(*Published in full in* THE LARYNGOSCOPE, *September*, 1907, *page* 693.)

DISCUSSION OF PAPERS BY DRS. SOLIS-COHEN, INGALS AND SWAIN.

DR. INGALS: Dr. Cohen spoke of using cocaine and adrenalin in removing growths from the larynx. I do not see any reason why the adrenalin and the cocaine should not be put together, so as to save some of the mopping. In early days, I had a good many cases with disagreeable constitutional symptoms; and I have been greatly surprised at the amount of cocaine used by some of my colleagues without producing these disagreeable symptoms. One of them used an adrenalin solution 1:1000, in which he dips his mop; then he puts the mop into the crystals of cocaine, and applies it freely to the nose of even little children. He has never had disagreeable constitutional symptoms follow this procedure. Within the last year or two, I have used this, putting in enough cocaine to make a twenty per cent solution. I suppose the adrenalin prevents the absorption of the cocaine, and thus prevents the constitutional effects.

Dr. Cohen also spoke of mopping the wound with the compound tincture of benzoin. It seems to me that this is improved by putting in an excess of the gum benzoin, two drams to the ounce. This makes a film that will last considerably longer than will the compound tincture alone.

Dr. Hubbard: I have observed that in etherized patients adrenalin does not produce local ischemia—at least, in the nose. I have noticed this several times. Whether it is merely a coincidence or was due to some fault in the solution I was using (although this was freshly prepared); or whether there is some physiological antagonism between ether and adrenalin, I do not know. I put the question to the manufacturers, and they said that they would investigate the matter. I should like to know whether others have observed the same thing. I have not made the same observation with reference to chloroform.

Dr. Clark: I should like to know whether a microscopic examination was made of the growth after its removal. I think Dr. Cohen's method of operation gives valuable suggestions regarding the mode of procedure in these cases.

I also want to report the present condition of a patient of mine with cancer of the larynx, operated on ten years ago. He was then fifty-nine years of age. The growth was removed by thyroidotomy. The larynx was split and the soft tissue on one side of the larynx thoroughly removed, and he made an uneventful recovery. The case was reported two years afterward and the article was published in the Boston Medical and Surgical Journal. The diagnosis was epidermoid cancer. I have a letter from the patient which I received just before leaving home. In this he says that he is now seventy years old. His general health is good and his voice is quite strong, although not so strong as before the operation. His friends notice no difference in it in conversation. I wish to put on record this case, in which the patient is well ten years after the operation.

Dr. Gordon King: In the case of a patient of mine operated on two years ago for an epithelioma about the size of a small coat-button, just above the vocal cord, we had to do a preliminary tracheotomy and then a thyrotomy. He is an enormous man, weighing two hundred and eighty pounds. The growth was removed down to the cartilage; and then Dr. Swain's method was pursued. The man is a lawyer, and was very much concerned about the probable effect of the operation upon his voice. I felt a little uneasy about it myself. The larynx now shows scarcely a trace of the operation, and the patient's voice is perfectly preserved. We removed about half of the vocal cord, cutting right down to the cartilage. The cord has been re-formed, and the mobility of the cord is preserved. He says that his voice is even better than before the operation.

DR. MYLES: I believe that there is something individual in these cases of epithelioma of the larynx. At the meeting of the American Congress held two years ago, I reported a case in which I had removed a tumor from the larynx near the vocal process about a year previously. It was found to be an epithelioma. I asked the patient whether he wished me to do an external operation, and he said he did not. I saw him about three months ago, and found that he has had no trouble since. I do not believe that this growth was a true epithelioma of the type that penetrates deeply, although the pathological demonstration showed it to be so. I do not think that a cancer of the deeply penetrating type can be cured. The one removed in this case was probably similar to the kind of epithelioma that sometimes grows around the eye. Oculists remove a great many of these from the eyelids, and the patients recover.

DR. DELAVAN: I have with me a letter from an old patient bearing upon this point. It may interest you to know what he says. The patient was a man of thirty-five years ten years ago, when he came to me for a small growth on the right side of the larynx near the right ventricle, which was diagnosed by one, at least, of the very best men in New York City as a papilloma. I was advised to remove it. It did not seem to me, however, to be a simple papilloma. I had the patient operated upon, two-thirds of the larynx being removed. When we split the larynx open, we found the nodule to be but a small expression of the whole disease. More than half of the cartilages had to be extirpated. The patient was a man in the prime of life—strong, brave, good-natured, and with no complicating conditions. He made a brilliant recovery. I have received from him this letter, which I will read because I think that we do not consider enough, in this or in any other direction, the ultimate condition of patients operated upon, no matter for what trouble. It is important to look ahead and try to read the future of such cases.

He says he has been working as hard as he knows how to hold his position, which is that of a salesman in a large cloth-house. He is struggling against great odds, as he is always very tired when his work is done. He feels, however, that he must keep working away, as the only thing he knows how to do is to sell goods. From the character of the man, I know that this is a tremendous confession for him to make. About four weeks ago, he was taken sick. A cold settled in his throat, and his voice was gone. As soon as he was able, he went to Toledo, Ohio, to consult a throat specialist, who, the man was glad to find, was an old acquaintance of my own.

The history of this case is as favorable as possible. It is, however, not so favorable as would have been the result of thyrotomy of any of the cartilages or their parts; but, on the whole, the conditions were exceedingly good. I bring the case up to call attention to a paper read, not long ago, by the gentleman who operated on this case, Dr. Curtis, on the impossibility of curing cancer. He has been a leading surgeon for twenty years, and has been as conscientious and as earnest an advocate of operative procedures as any man here present. Although he brings up nothing new, he sums up the general opinion that cancer does not admit of cure, and that we cannot expect it to do so. An operation sometimes palliates; but to talk of its curing is almost to beg the question. The time-limit arbitrarily set upon cases, whereby, for instance, it is said that a case that has been free from recurrence for such a length of time must be considered as cured, is not to be relied upon. An epithelioma of the edge of the epiglottis constitutes one of the most favorable cases. I had always thought that this patient's case was rather favorable; but in this case, in which, of all others, one would expect that a cure would be effected by removal, I believe that now, at the end of four years, recurrence is taking place. When we place the time-limit at three years, therefore, we are in error. Operations for this trouble have been discussed and thrashed over for years, yet no better presentation of the correct technique could be given at the present moment than the one given by Prof. Cohen. Under this method of procedure we are likely to obtain the best results; but the whole gist of my remarks leads up to this: That all methods are hopeless and are disappointing in the main. We cannot, therefore, too strenuously urge haste upon those trying to discover some cure for cancer. The history of cancer of the larynx is typical of cancer throughout the body, though it is a little more dreadful than the same disease as found in some other parts. I believe that each one of us would be doing right in stimulating those engaged in this investigating work to use all possible earnestness in hastening the advance that we feel sure will ere long put surgery out of this field entirely.

DR. MOSHER: I should like to speak briefly of a case in my experience. We may not cure, but we can relieve; and that relief is often obtained in even very extreme cases.

The case I refer to was one of most desperate type admitted recently to the Massachusetts General Hospital. An emergency tracheotomy was done to relieve the patient from immediate danger. Then, when the diagnosis had been ascertained, the case came to operation. The growth was found to be extremely extensive; and when the operation was over, the whole of the larynx and the anterior wall of the esophagus had been removed, and I had gone as far as the suprasternal notch. It did not seem to be worth while when doing it, and I was surprised to find afterwards that it had been. This young man was practically asphyxiated, and within a few weeks would have starved to death; but he was made comfortable, and is so now. There is a recurrence, but the disease is in the chest, and a secondary operation may be done for that. This man was not in poor circumstances. He was a man of some social importance, and his experience for six months more meant everything to the corporation to which he belongs; and it certainly seemed worth while to give him that six months.

DR. COHEN, closing: With all the rest, I congratulate Dr. Ingals on the success of his case of intralaryngeal removal. He mentioned, in the report of his case, that his patient did not get better until after an attack of influenza. I have seen a number of patients with malignant disease of the throat get well after influenza, as also after an attack of erysipelas.

As to mopping with cocaine and adrenalin together, I have no doubt that it would do just as well; but the cocaine in my case was intended to get rid of the reflex of the larynx. As I used 1:1000 adrenalin, its use was confined to the immediate region of the growth.

The reason I used compound tincture of benzoin, although I usually prefer acid nitrate of mercury as a caustic, is that in this case I had removed the perichondrium. I was afraid that if I applied an escarotic I should do injury. I thank the doctor for his suggestion of adding the benzoin, for I have no doubt that it will make better lasting varnish. I almost always give a general anesthetic, unless the physician is much opposed to it, I use chloroform. I have no experience in the use of adrenalin in cases under ether anesthesia.

Dr. Swain, closing: First, as regards adrenalin and ether there is an antagonism between the action of ether and the paralysis of the control of these motor nerves that the adrenalin makes by contraction of the vessel wall.

In answer to Dr. Clark's question, I would say that the case was positively epithelioma. When we took it out in sections, we could see the penetrating form of the growth. I omitted the microscopical examination, in order to make my report briefer.

Dr. Myles says that there are various kinds of epithelioma. There are varying degrees of malignancy in every kind of tumor.

In answer to Dr. Delavan, it was for that same reason that I related my case. With so much said against operations for cancer of the larynx, and so much evidently bad in our prognosis in such cases, here was an instance in which the sunny side came out; and we ought to bring that side into contrast with the shady picture brought up by Dr. Delavan. In some cases we can cure, however. We have got to do it by surgery; and when we do not possess any method except surgery, let us make this accomplish as much as possible.

[*(Proceedings of the American Laryngological Association to be Continued.)*]

Primary Perforating Epithelioma of the Velum Palati. Dr. Ghauffard. *La Presse Med.*, Mar. 27, 1907.

The patient's attention was first attracted by a slight pharyngeal annoyance during deglutition, and occasional pains in the ears; shortly afterwards there was a perforation of the velum palati as shown by the regurgitation of liquids through the nostrils.

On examination, there was found a tumor composed of a large infiltrated mass, ulcerated, bleeding easily, giving an offensive odor; there was a long antero-posterior perforation, surrounded by a border of grayish white spots resembling tubercles.

The diagnosis of the neoplasm, made in spite of its rarity, was confirmed by the histologic examination. Scheppegrell.

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

A CONSIDERATION OF THE "HERD" THEORY AS AN ETIOLOGICAL FACTOR IN OZENA.*

BY CLEMENT F. THEISEN, M. D., ALBANY, N. Y.

In this paper the writer will limit himself to a consideration of the "Herd" theory as a cause for atrophic rhinitis. Ozena, which, according to its Greek derivation, means really a stench, should not be considered a disease by itself, but rather a symptom of some other underlying pathological process. It seems to the writer that it would be less confusing to speak of all cases in which the characteristic atrophic changes with crust formation are present, as cases of atrophic rhinitis, whatever the cause may be.

In considering the etiology of ozena or atrophic rhinitis from the viewpoint of accessory sinus disease, the "Herd" theory of Gruenwald, Hajek Loehnberg, Michel and others, I, of course, am fully aware that we can only explain a certain percentage of the cases in this way. But I am convinced that a fairly large percentage of ozena cases are associated with disease of the accessory cavities.

I would like briefly to give the results of my own observations: In 1904, in the January number of the Albany Medical Annals, a preliminary report of the results of examinations of the accessory sinuses in ozena cases was given. In this paper the twenty-one cases then reported will be briefly reviewed, and a further report of thirty-nine cases will be given, sixty in all. These were all cases in which the characteristic atrophy of the membrane with crust formation was present.

In eight of the twenty-one cases first reported, positive evidence of sinus disease was found. In four cases, chronic maxillary sinusitis, in two combined with chronic ethmoiditis existed. In three cases, ethmoiditis existed alone (cases of unilateral atrophic rhinitis), and in one case chronic frontal sinusitis and ethmoiditis. In the three cases in which the ethmoidal cells were found diseased, the atrophic process was practically confined to the middle turbinal body, and in these cases a direct etiological relationship certainly appeared to exist between the ethmoid disease and the localized atrophic changes. These cases were greatly benefitted by curettage of the ethmoid cells.

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*Part of a Symposium read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, February 26, 1908.

In the second series of thirty-nine cases, accessory sinus disease was found in six cases. In two cases ethmoid and antral disease was found, in two ethmoid disease alone, in one frontal and ethmoid, and in one ethmoid and sphenoid. In this series of cases also, in the two cases in which ethmoid disease was found, the atrophic process was practically limited to the region of the middle turbinate. The writer's cases then show fourteen cases of accessory sinus disease out of sixty ozena cases, or about twenty-five per cent.

The methods used in arriving at these results were briefly as follows: In every case as thorough an investigation as possible of the accessible sinuses was made. The nostrils of each patient examined were first freed of crusts, and thoroughly washed out, and then transillumination was employed. The maxillary antra in all cases in which the patient's consent could be obtained, were punctured in the usual way through the naso-antral wall and washed out. In the cases in which it was found that antral disease ex-instead, decomposing and usually foul smelling secretions were washed out.

The diagnosis in the cases in which chronic frontal sinusitis was found, was made by transillumination and by washing out the sinus when possible. In one of these cases the radical operation was performed, and a greatly thickened and degenerated membrane with some pus was found. The nasal condition was greatly benefitted by the operation. In one case in which ethmoid disease had been found, a large sequestrum was removed. It was part of the left lateral ethmoid mass. The ethmoid cells were filled with a thick, foul smelling secretion. This patient was probably a syphilitic subject.

Time will not permit me to give a detailed report of every case in which sinus disease was discovered, but it may be of interest to consider one or two of the individual cases.

In the case of Miss S., aged thirty years, a foul-smelling discharge had existed since childhood. In this case ethmoid and sphenoidal sinus disease was present. The atrophic process was so extensive that the sphenoidal sinus could be readily probed.

Several operations were performed with the result that the crust formation and odor have practically disappeared. This patient I have had under observation for many years.

In another case, a boy, aged nine years, there was a history of an attack of nasal diphtheria five years before I saw him. His mother, who contracted the disease from him, stated that from the time he had diphtheria, he had suffered from occlusion of the nostrils, and an offensive yellow discharge. On examination, both nostrils were filled with badly smelling soft crusts, and the typical atrophy was present. When the crusts were removed, pus could be seen in the middle meatal region of both nostrils, and was found to come from the maxillary antra. Cultures were taken from both nostrils and examined in the Albany Bender Laboratory by Drs. Pearce and Winne, who reported that they showed the presence of typical diphtheria bacilli, in conjunction with an organism that was probably Friedlænder's Bacillus mucosus capsulatus. The non-virulency of the organisms was proved by inoculating guinea pigs with pure cultures of the bacilli obtained from the nose. The animals all remained well.

The mother positively stated that the boy's nose had never troubled him before his attack of diphtheria, so that in this case there does not appear to be much doubt that the antral empyema caused by the diphtheria infection was responsible for the typical changes in the nose. It is also of interest that the bacilli were still in the nose after five years.

The majority of the cases of atrophic rhinitis seen by the writer occurred in children and young adults, and in many cases a history of measles, scarlet fever, or diphtheria from which the patients had suffered early in life was obtained. A common statement of the mother or father was that the child had had a yellow discharge and bad smell from the nose off and on since the attack of scarlet fever or diphtheria, and this brings us to what I believe is one of the most important etiological factors in connection with the "Herd" theory of atrophic rhinitis and a strong argument in its favor.

The discharge from the noses of these children, following their infectious disease, was caused by an infection of one or more of the accessory cavities, and it is a reasonable deduction that in some such cases the mechanical irritation produced by the more or less constant discharge would finally lead to the atrophic changes in the membrane.

The investigations of Pearce are of interest in this connection because they show the frequency of accessory sinus disease as a complication of diphtheria and scarlet fever in early childhood. Pearce examined the accessory sinuses of fifty patients who had died of diphtheria or scarlet fever in the Boston City Hospital. Thirty-nine cases of diphtheria were examined, and in twenty-five, changes in the accessory sinuses were found; both antra in sixteen; both antra, sphenoid and ethmoid sinuses in two; one antra only in five, and the sphenoid sinus only in two. Of the eighteen double antrum cases, the exudate on both sides in three was a thick yellow pus; in three a purulent fluid with membrane, and in one, a cloudy serous fluid with membrane. Five cases of diphtheria with scarlet fever were examined, and in two changes in the antra were found; one was unilateral and contained a thick, yellow pus. Two cases of diphtheria with measles were examined, and both antra in each case contained a sero-purulent fluid. Four cases of scarlet fever were examined, one antrum was normal; in one case there was a double empyema, and in another, both antra and the sphenoid sinus contained greenish pus.

Forty-four of these children were between the ages of two and six years. The fact that cultures from the nose showed the presence of diphtheria bacilli, which in some cases on record persisted for months and years, is of great importance, because in such cases the infection undoubtedly persisted in the sinuses, and it is probable that sinuses so infected would not get well until they were opened and properly treated. Such conditions in very young children would very likely go unrecognized for a long time, and there is no good reason why the more or less constant discharge over the mucous membrane would not finally produce localized atrophic changes. There is no doubt that many of the cases of so-called purulent rhinitis of childhood, belong in this class.

Emil Mayer has also reported a case of purulent antral empyema in a child two and one-half years old, following scarlet fever and diphtheria.

These reports prove the fallacy of the theory advanced by some writers, that cases of atrophic rhinitis reported in very young children, could not be secondary to sinus disease because the accessory sinus did not exist so early in life. It is probable that a large percentage of children who have had infectious diseases, have, as a result, a purulent sinusitis, and a certain percentage of them certainly later on have an atrophic rhinitis.

Loehnberg, who at the present time, is perhaps the most enthusiastic advocate of the "Herd" theory, states that he found the accessory cavities diseased in every one of seventy-nine ozena cases, i. e., twenty-four times an empyema of the sphenoid sinus; six times of the frontal; ten times of the ethmoidal cells and thirty-nine times of the maxillary antrum. This is certainly a strong argument in favor of this theory. Alexander quotes the investigations of other authors who reported twenty-two autopsies of atrophic rhinitis cases. The accessory sinuses were diseased in eight of these cases.

Michel believes that ozena depends mainly upon a purulent inflammation of the accessory cavities, particularly the ethmoid cells and sphenoidal sinuses, and Gruenwald also states that a considerable percentage of ozena cases are caused by purulent processes in the accessory cavaties. While Hajek is of this opinion, he does not believe that this alone is sufficient to explain the pathogenesis of the whole clinical picture of ozena.

In conclusion, it appears to the writer that the "Herd" theory offers the most reasonable explanation for a fairly large percentage of atrophic rhinitis cases. None of the other theories, the rarefying osteitis theory, the theory that the atrophic process follows a previous hypertrophy of the membrane, and others too numerous to mention, give a satisfactory explanation for the large amount of secretion necessary to form the large crusts we see in some cases.

The function of the mucous glands must certainly be seriously interfered with when they become destroyed, as they do in severe cases, because microscopical examinations do not show glandular elements in tissue atrophied to the extent that it is in certain advanced cases of atrophic rhinitis. The secretions in many of these cases must come from the neighboring sinuses. If the theory that a rarefying osteitis, producing a shutting off of the blood supply to the mucous membrane, is correct, why should it in some cases produce atrophy, and in others just the oposite condition, oedema and polypoid degeneration of the membrane?

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172 Washington Avenue.

A Case of Vincent's Angina in which the Larynx and Trachea were Involved. H. W. BRUCE. *Lancet,* Oct. 12, 1907.

Describes a case in a man, aged 47, in which Vincent's angina not only involved the fauces, but attacked the mucous membrane of the larynx and trachea. The characteristic bacilli were present in large numbers in smears taken from the slough, but no spirilla were discovered. Laryngeal obstruction necessitated laryngotomy. At the end of five days, although respiration was relieved, the tissues of the neck around the wound were attacked by a sloughing process. The skin and subcutaneous tissues were converted into a gray foetid material; the gangrenous process spread outwards and downwards as far as the clavicle, the lungs became involved; and the patient died eleven days after admission. Postmortem examination showed sloughing of the uvula. A thin green slough covered the ary-epiglottic folds, the mucous membrane below the false cords, and the trachea almost down to the bifurcation. The author remarks on the unusual features of the case, and compares it with the mild form of phagedaena or hospital gangrene.

THOMSON.

THE PATHOLOGY OF ATROPHIC RHINITIS WITH OZENA.*

BY D. BRADEN KYLE, M. D., PHILADELPHIA.

Much confusion exists in the nomenclature of these two conditions, largely due to the fact that different individuals apply the term "atrophic" to entirely different processes. One thing certain is that there are forms of atrophy peculiar to the nasal mucous membrane, and some of these conditions are associated with ozena. Why do we not have this condition of atrophy in other mucous membranes? This certainly does not exist, and it forces us to the conclusion that either the mucous membrane itself or its function predisposes this membrane to an atrophic change, or changes

Personally, I believe there is no one cause of atrophic rhinitis, but that there are many conditions, both external and internal, that lead to pathological changes in the nasal mucous membrane, which bring about the condition known as atrophy. Seen at different stages, it will be described as a different variety; yet, the ozena which is associated with some cases and not with others, may have its origin in the altered secretion, in the secretion, even, of the glands of the mucous membrane, or may come from an involvement of an accessory cavity. This accessory cavity involvement may be primary, or it may be secondary.

Very few observers have had the opportunity of studying a case from its beginning. It is always developed before the physician sees it. Personally, I have seen many cases of atrophic rhinitis with ozena, in which there was no involvement of the sinus, but in other cases I have observed the ozena was without any atrophy, in which there was involvement of the sinus; so that it brings us to this conclusion: That we may have atrophic change with ozena; we may have atrophic change without ozena; we may have ozena and atrophic change in which there is associated a lesion of the sinus, either primary or secondary. We may also have associated lesions of the sinus with ozena, in which there is no atrophic change in the nasal mucous membrane, and while the process when completed may be the same, yet the causes are different, and no one definite etiological factor can be assigned.

On examination of tissue taken from atrophic cases, in some instances the tissue itself, even after removal, still had the odor so peculiar to ozena. This would seem to point to some chemical change in the gland structure. The odor of atrophic rhinitis varies, and I think is due to different causes in different cases. Various bacteria have been found, but the same bacteria can be found in decomposed secretions elsewhere.

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*Part of a Symposium read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, February 26, 1908.

The mucous membrane of the accessory cavities secretes very little mucous, and if these cavities are inflamed, then the secretion is not mucous but inflammatory product. The mucous secreted from the nasal mucous membrane under normal physiological conditions does not tend to form crusts and adhere to the mucous membrane. In atrophic rhinitis, with or without ozena, this, however, is the case, showing an altered mucous membrane and altered gland structures, with necessarily altered secretion. That this secretion is altered is proven when an attempt is made to thoroughly cleanse the mucous membrane. This we all know in an atrophic case is practically impossible to do.

Atrophic rhinitis usually begins in childhood, it is very true, and it is possible that the blood supply is sufficient up to a certain period of development, and then, owing to faulty formation, as some of the blood supply comes through bony foramena, these may not develop sufficiently large to allow sufficient nutrition to be carried to the part; hence, the atrophic change.

The general condition plays a great part as an etiological factor. So does heredity. I think, however, that we can sum up the whole condition as follows: That there is not any one etiological factor as a cause of atrophy of the nasal mucous membrane. Second, that the source of the odor in the condition known as ozena has no one origin. Third, that there may or may not be associated sinus lesion, either primary or secondary, to the atrophy or ozena; that we do have an atrophic condition which follows a simple chronic inflammation with contraction, that we do have an atrophic condition due to faulty nutrition from other causes; that we do have an atrophic rhinitis which is truly atrophic change. We may also have an atrophic rhinitis similar to that condition seen in the liver, which is known as red atrophy, in which the membrane, although puffy and cyanotic, is strictly atrophic as to function and cellular structure brought about by venous stasis. No specific bacteria will account for all cases of atrophy of the mucous membrane or all cases of ozena.

1517 Walnut Street.

THE TREATMENT OF ATROPHIC RHINITIS, INCLUDING OZENA*

BY ROBERT E. MYLES, M. D., NEW YORK.

For convenience, and a more thorough understanding of its nature, the writer has divided the clinical history of the true or typical atrophic rhinitis into three stages:

First: The mucopurulent stage of childhood.

Second: The incrustation or ozena stage, which develops in patients between four and sixteen years of age, and never afterward in patients observed by the writer.

Third: The adolescent stage, which may be observed from the age of twenty-five to the end of the oldest life.

The proposition that the early or incipient stage is the best one in which to treat a case of tuberculosis, cancer, diphtheria, and numerous other diseases, should hold equally well in atrophic rhinitis. I have never been able to make or to find in recorded literature a complete clinical history of a case of atrophic rhinitis. Bosworth's remarkable and brilliant observations of the symptoms of the first stage of this strange disease have been mostly corroborated by the patient's statements for the author's clinical data. My belief, based upon the best evidence which I have been able to collect from literature and patients, is that it essentially an infectious disease of childhood. Yet I am fully aware that the testimony and proofs are not sufficient to make this belief into a fact.

I was prompted to participate in this symposium by the hope that some of the members of this Section and the Section of Pediatrics could be induced conjointly to colleect some reliable data concerning the first stage of atrophic rhinitis. The task will be difficult, for it must extend over many years.

The writer has considereed nearly every case of bi-lateral perennial suppurative rhinitis in children as a possible atrophic case. He has commenced the treatment by removing whatever obstruction there might be to the breathing, and also by increasing the nasal drainage in any way that might seem expedient. Naturally, the little patients could not be expected to visit a specialist frequently throughout a series of years for an almost unnoticeable post-nasal catarrh. Those whom I have seen from time to time and who have been fairly persistent in the home treatment, have so far failed to develop the foetid ozena type. I have been able to follow up only a very limited number of these muco-purulent cases. This would show that all cases of perennial suppurative rhinitis do not terminate after treatment in atrophic rhinitis associated with ozena, but it does not prove that all cases of atrophic rhinitis are not preceded during childhood by perennial muco-purulent rhinitis. I am most anxious to know if any member of this Section has the history of an atrophic case in which there was not a perennial muco-purulent discharge in the rhinopharynx previous to puberty.

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*Part of a Symposium read before the Section on Rhinology and Laryngology, New York Academy of Medicine, February 26, 1908.

The writer has used the alkoline solutions with the pipette and spray—such as Dobell's, Seiler's, or those of chloride or bicarbonate of sodium. It was noticed that they were more efficacious when used quite warm. A weak solution of hydrogen dioxide one in five or ten of water, instilled slowly into the nose, will aid in dislodging the mucous which may be fixed in the crevices and under the turbinals. After the nose has been cleansed according to instructions, the nurse or child is taught to use about one-half of a grain of a powder which is composed of one part of boric acid to two parts of aristol. This is to be insufflated into each nostril with the author's aseptic powder blower, once a day, preferably before retiring. The morning treatment is the same with the alkaline and germicidal solutions and the peroxide, to be followed by the use of either of the following ointments:

R.	Or— R.
Ichthyol, drams i or drams ii.	Nosophen, grains xxx.
Lanoline, drams ii.	Lanoline, drams ii.
Vaseline alb. ad. oz. i.	Vaseline alb. ad. oz. i.

The best method of introduction discovered so far has been by twisting cotton on a match from end to end; then, covering the non-sulphurus end with the ointment, insert it about one-half to three fourths of an inch within the vestibule. Make firm pressure with the thumb and index finger of the opposite hand on the alae nasi and at the same time gently withdraw the match and cotton. After this, two or three times a day, an abolene spray with one grain each of eucalyptol, acid carbolic and menthol, to the ounce, is used through some reliable atomizer.

These little patients are seen usually at very irregular intervals. Turbinals are reduced when they appear to obstruct the drainage from the accessory sinuses and the fossae. The recesses are cleaned with the cotton applicators, alternately dipped in solutions of various astringents, antiseptics and germicides. I have found a twenty-five to fifty per cent solution of argyrol the least irritating.

We are waiting for the pathologist to give us the pathognomonic evidence of the first tage of atrophic rhinitis, so that we will know when we cure a case. Nearly all that has been written about atrophic rhinitis has been confined chiefly to the second stage, since the crusts and odor of this stage are most manifest and objectionable.

The treatment of the second stage consists of removal of the malodorous crusts, the prevention of their reformation, and operative procedures on the accessory sinuses. The general details of the local, non-operative treatment of this stage have been given so often and so extensively by Dr. Richards and others that I will not detain you by repeating them.

I present some perforated glass tubes made by Van Horn and Sawtell, which have been found safe and satisfactory when attached to a fountain syringe, provided they are moved about during the act of irrigation. The physician should carefully cleanse the nose and rhino-pharynx, and at the same time instruct the patient in a practical manner in all the manipulative details for cleansing and for preventing the formation of crusts of semi-inspissated secretion. Patients should be instructed in the gentle use of the cotton applicators which have been dipped in the ointment or solutions which have been prescribed. They should also be taught how to apply the cotton or gauze tampons, when it is desired to modify or stop the air from passing through the nose. In the cases which show the diphtheria bacillus, I believe that we may expect much benefit from the use of anti-toxin. I have seen several cases which made marked and rapid improvement after the administration of anti-toxin for diphtheria.

I have operated on the sphenoidal, ethmoidal, frontal and antral cells in several cases during the second stage. While decided reduction was noticed in the amount of the secretion and crusts, it was not commensurate with the relief secured in similar cases which were operated on during the third stage. Judging from my experience, I can state that proper operative treatment of the nasal accessory sinuses, in addition to the local treatment of the other stages, has given me the best general results. When safe and feasible, it has been my effort and custom to make large and permanent openings in the anterior sphenoidal cell walls, ethmoidal cell floors, and antro-nasal walls. This, of course, in cases where secretion flows chiefly from the cells.

In summing up, I will state that my treatment has been directed against a disease which I believe belongs essentially to childhood. The later manifestations of arrest of development and atrophy are more or less the results of mechanical flooding of the parts by a peculiar tenacious secretion. The cause of the secretion, in my opinion, is an infection which only finds a suitable culture soil on the mucoso before the age of puberty.

In the treatment of the second stage, I thoroughly remove all the semi-inspissated secretions which readily undergo degeneration and decomposition and produce a most offensive gas.

The writer has kept some of the crusty formations in corked bottles for several days, and the ordinary stench from atrophic ozena would be considered sweet perfume when compared to the odor from the bottles. Every effort should be made by the patient, under the instruction of a physician, to prevent crust formation, and I advise operations, in favorable cases, on the accessory sinuses.

In the third stage, when the atrophic changes are naturally on the decline, the objectionable features in many cases show signs of a spontaneous abatement and it is in this stage that operations on the accessory sinuses have given the best results. Ozena has disappeared after thorough operations in all cases of syphilitic or suppurative necrosis of the bones, and in cases of putrid debris or degenerative conditions in the respective sinuses.

46 West Thirty-eighth Street.

THE TREATMENT OF ATROPHIC RHINITIS.*

BY GEORGE L. RICHARDS, M. D., FALL RIVER, MASS.

The treatment of Atrophic Rhinitis must be based somewhat on one's idea of its etiology and pathology. In another sense, however, the treatment is much the same, whatever theory one may have as to its etiology and pathology. There is an atrophy of the gland, elements of the interior of the nose from some cause, accompanied by the pouring out of a thick, sticky secretion covering the nasal mucous membrane, the frequent presence of a vile odor, great discomfort and a sense of blocking up of the nose. The whole condition is intensely disagreeable to the patient and his friends and for this he seeks relief. It is evident that what is desired is an increase in the amount of, and a change in the quality of, the gland secretions together with the removal of the prime cause if it can be determined. This will be best brought about by the combined uses of internal and external remedies.

Internal Remedies. These may be divided into two classes: first, those remedies which have been found to have some influence in increasing glandular activity of which iodin is the essential ingredient. Of these, Iodide of Potassium, Syrup of Hydriodic acid, and Iodide of Sodium are principally used. I have found Syrup of Hydriodic acid in teaspoonful doses to very materially aid in increasing the fluidity of the secretion. As many of these patients suffer from anemia, general tonics, especially those containing iron and arsenic are frequently necessary. The various types of these best suited to the individual case will readily suggest themselves.

When the Pseudo-diphtheria bacillus or the Pneumo bacillus of Friedlander was thought to be the cause, many observers began using antitoxin, and with alleged good results. Mygind of Copenhagen, reported some ten cases of genuine ozena treated exclusively this way. He used ten cubic centimeters in adults, five cubic centimeters in children, repeating in eight to twelve days. At the end of the first twenty-four hours, the crusts became softer and came away more readily. These good results were probably, however, entirely due to the fact that the antitoxins increased the glandular activity, thereby lessening the fetor. This method of treatment was not infrequently accompanied by painful swelling at the point of injection and various forms of skin eruption. So far as any real cure is concerned, the method is probably useless, it is expensive, the dosage is large, and I think is not now much used.

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*Part of a Symposium read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, February 26, 1908.

Local Treatment. A great variety of treatment has at one time or another found vogue, a variety so great that it is evident from its mere enumeration that relief of the condition and not the cure of the disease, is about all that is to be expected by the treatment. For local treatment we have first, destructive agents such as escharotics; electrolysis, the positive copper inserted in the inferior turbinate, the negative platinum in septum; the galvano cautery; strong solutions of nitrate of silver; perchloride of iron and the like.

Grossman of Vienna is using the X-rays administered to the nose through a large funnel, the front of the body being properly protected, and says he is getting improvement, though he has not used it long enough to make any definite statements as to its value.

As deodorants, the list includes: Iodoform, Citric acid, Iodol, Camphor, Permanganate of Potash, Salicyclic Acid, Acetozone, Hydrogen Peroxide, Bichloride Mercury, 1-4000; Formalin, Lysol. While as stimulants, many of which are also deodorants, we have a long list, so long that I hesitate to read the names, even of those which I have found to be in more or less use: Aristol, Salicylic Acid, Tannin, Alum, Rhatany, Opium, various stimulating volatile substances, singly or in combination. Menthol, Thymol, Nosophen, Europhen, Menthoxol, Camphoroxol, Eucalyptus and other essential oils; Cubebs, Tar, Pyoktanin, Borax in Glycerine, Chloride of Ammonium in Glycerine, Chloride of Potassium, Phosphate Sodium, Phosphate Ammonium, Terebene, Kreolin and Menthol Vasogen, Creosote, Creolin, Resorcinol, Ichthyol, Phenol Natrosulphuricum, Kalisozoidol, Zinci Sozoiodol, Ammonio-Sulpho-Ichthyol, 30-40 to 100; Stearate of Zinc alone and with many combinations; Yellow Oxid of Mercury, Rhodan, Nitrate of Silver in different solutions and the proprietary silver salts. These are used in varying strengths and in every media, some in watery solutions, some in oily solutions, some as ointments, depending on the character of the internal drugs.

Mechanical stimulants in the form of medicated bougies and the use of cotton tampons, have had much vogue, also massage by electricity and by rubbing the affected membrane with cotton tipped applicators in order to increase the blood supply and stimulate gland activity. Injections of paraffin underneath the mucous membrane of the turbinate, especially the inferior, have been used with the double purpose of stimulation and of lessening the caliber of the nares. I think the results have not been such as to warrant its further use.

Surgical measures within the nose have had their advocates. Curetting the nasal mucous membrane seems to me hardly indicated since after its use the new tissue which forms will be destitute of glands and can therefore be of but little use as a secretive tissue. Correcting deviations of the septum and the removal of projections and spurs, thereby balancing the two sides of the nose so far as the respiratory function is concerned, I have several times found to be of advantage.

Iglauer of Cincinnati, on the theory that the saliva of the mouth might have a therapeutic effect in modifying atrophic processes and would perhaps have a stimulating or irritating effect upon the diseased mucousa, devised an Ora-Nasal Canula so as to bring the saliva into the nose. As this requires a surgical operation and a permanent opening from the mouth into the nose, with a continuous wearing of the canula, this method of treatment has more of scientific interest than of practical value, since few patients would submit to such an operation even though results as in the three cases reported by Iglauer were satisfactory. Of the three cases reported by him, in which the canula was worn without discomfort the first case relies chiefly on salivation, the second on salivation and irrigation, while the third, with scant salivary flow, relies chiefly upon irrigation.

The various local applications are of value, and serve a useful purpose in the treatment of the disease, yet the good result obtained from them is, it seems to me, due as much to the thorough preliminary cleansing which is necessary before any application is made to the diseased mucous membrane as to any specific curative power inherent in the remedy used. I have tried a great variety of these with the results about as good with one type of drug as another save that I do not think that medicines in oily solutions quite as good at watery solutions. In this connection I am entirely in accord with the remarks of Dr. French, made before the section in 1900: "Oily solutions unquestionably give vast comfort to the patient, but unfortunately, prolonged and uninterrupted use of them is apt to hasten the course of the disease. First, because they aid in destroying the activity of the secreting glands by preventing proper evaporation; second, because they tend to choke and block the mouths of the glands themselves; and, third, because they prevent, to some degree, the serum of the blood from reaching the current of air. Keeping the mucous membrane covered with an oil simply lubricates it; affecting only the comfort of the patient for the time being, but it is in no sense curative. Oils should be used, therefore, sparingly, and, as a rule, intermittently and should be applied only after thorough cleansing of the nose with a saline wash, and that saline wash should be used before and after a spray of peroxide of hydrogen."

In the recently published transactions of the American Laryngological, Rhinological, and Otological Society, Keiper of Lafayette, Indiana, and Beck, of Chicago, report their results in the treatment of the disease. Keiper regards the local use of strong solutions of nitrate of silver (20-30 per cent), as curative, while Beck, after mildly censuring me for not paying more attention to the sinus as a causative factor, in my paper of 1906, gives his experiences with the radiograph as a means of determining whether the sinuses are affected or not, and then reports the treatment of twenty-four cases thus radiographed, all but three of which showed some involvement of the sinuses. These he divided into six groups according to treatment:

1. Irrigation of the various sinuses with iodine, formalin and sodium chloride: Results good.
2. Intra-nasal operative interference: Relief.
3. Paraffin injections into the inferior turbinate body: Improvement at once, which has continued.
4. High frequency current in nasal and pharyngeal spaces: Improvement.
5. Biers' constriction treatment: Improvement.
6. Vapor therapy using iodine, formalin and sodium chloride: Great improvement.

He thinks intra-nasal surgery gives the best results and that the results of local treatment are due to hypermia and leucocytosis, this bringing about a resolution or restitution of glandular structures and normal mucous membrane. Beck's results show that after caring for any sinus trouble which may be present, one method of treatment gives about the same results as another.

My own method of treating the individual case is somewhat as follows: First, a careful history, endeavoring to find out how long the disease has lasted, its probable etiology, its relation to the general health, and what therapeutic measures, if any, have been used. The nose and naso-pharynx are then thoroughly cleansed by syringing through the nostril and through the naso-pharynx a saline solution of which the well known Seilers' tablet or some modification thereof, is the base. A considerable amount of solution is not infrequently required. With the nasal speculum and cotton pledgets the nose and naso-pharynx are carefully cleaned of any remaining secretion and the condition of the mucous membrane ascertained. If there is the slightest reason for suspecting co-existent sinus disease, transillumination, puncture of the antrum, and probing of the sphenoid and frontal are done. I have very rarely found accessory sinus trouble to be co-existent. When it is, appropriate treatment for the condition is at once undertaken. The patient is then instructed as to the nature of the disease and impossibility of a complete cure, the possibility and probability of great improvement and his own co-operation in the treatment requested. Some form of stimulating application is applied to the nasal and naso-pharyngeal mucous membrane, preferably one containing icthyol and iodin or some of the milder silver solutions, as I do not believe that strong applications produce as good results as weaker ones. The patient is told to get a syringe, usually a three-ounce rubber one, instructed how to use it, and given a supply of alkaline tablets, two of which when dissolved in a glass of water will make a proper solution. With this solution, the nose is to be syringed at home three times a day at first. Syrup of hydriodic acid and some form of tonic is given internally and the patient instructed to report for treatment three times a week and certainly twice, until such time as he shall have returned with the nose free from crusts. With such treatment the crusts become more moist and less tenacious and in a short time the patient is much improved but is not cured and unless treatment be continued will soon relapse. I always tell such cases that unless they are willing to keep up the treatment for from six months to a year, faithfully keeping the nose clean much as they would brush their teeth, that it is useless to begin treatment. From time to time, variation is made in the local applications, the office treatment being continued until the patient returns free of crusts. In a few instances in young people, in whom I have been able to control the treatment for a sufficient length of time, it has seemed to me that I have produced an absolute cure. In one case in particular, a girl of fourteen to sixteen years of age, whom I had under observation for several years, there was apparently a perfect cure, and the last time I saw her, some four years after the beginning of the treatment, and two one one-half years after entire cessation, the nose seemed apparently a normal one. I have recently looked up several such cases with equally good results. I have, however, had other cases under observation the same length of time in which the conditions were fairly well controllable but the present state of affairs is, or would be if the treatment were omitted for any length of time, practically unchanged from the beginning.

84 North Main Street.

Roentgen Rays as an aid to the Diagnosis of Stricture of the Œsophagus. BERTRAM DAWSON. *Lancet*, Oct. 26, 1907.

Describes the method of watching the descent of the thick emulsion of bismuth by means of the Roentgen screen. The results are better seen if the observer stands in a dark sentinel-box for ten minutes before the radiograph is thrown on to one side of it.

THOMSON.

On the Megaphone in Cases of Deafness. C. CRESSWELL BABER. *Lancet*, Oct. 12, 1907.

Recommends an instrument measuring twelve inches in length, six and three-quarters inches in diameter at the large end, and two and one-half inches in diameter at the mouthpiece. It is made of glazed cardboard, or metal, and is very inexpensive. It avoids the necessity of putting any tube or ear-piece into the patient's ear, and enables one to speak to the deaf person without first drawing his attention.

THOMSON.

ATROPHIC RHINITIS AND OZENA.*

BY CLARENCE RICE, M. D., NEW YORK.

I took the liberty yesterday of jotting down a few points, my opinions and beliefs in regard to the etiology of atrophic rhinitis and ozena, and a few suggestions regarding the treatment of this disorder, because one's creed regarding this *obscure etiology* needs to be *carefully* stated. I feel it is unnecessary to say anything in regard to either the pathological appearance or symptomotology because these parts of the subject have not only been thoroughly stated this evening, but are well understood.

First, I have always felt that it serves no possible use to classify atrophic rhinitis and ozena as two distinct diseases or forms of disease. No one has ever proven that these are two distinct or separate pathological processes. If one chooses to use such terms as atrophic or non-fetid catarrh and the other as ozena or fetid catarrh, perhaps no objection can be made, but I feel that no use is served in teaching this classification to the student, simply because in one case we have a malodorous condition and in the other not.

I venture to-night to suggest a new subdivision of the forms of atrophic catarrh based on clinical appearances and symptomology. I think it may be shown that we have what may be properly termed an *acute* atrophic rhinitis, and, secondly, a *chronic* atrophic rhinitis. The chronic form is much more commonly seen; the acute form is the one occurring in children, or in young adults preceded by a profuse purulent discharge from both nostrils, a purulent rhinitis and oftentimes brought about by some of the eruptive fevers, diphtheria or grippe. I have long felt that the purulent rhinitis of children, so ably described by Dr. Bosworth, was, in the majority of cases, if not in all, a sub-acute bilateral sinusitis.

We feel that we are authorized in styling this form of trouble acute because of its very rapid onset, profuse nasal discharge, accompanied sometimes by slight fever, and soon a rapid degeneration of the turbinated bodies. Probably this same patient in middle life simply presents the ordinary appearance of an atrophic rhinitis.

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*Opening of the discussion of the Symposium read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, February 26, 1908.

Purulent rhinitis, therefore, I believe to be a double sinusitis and I think that all forms of sinusitis are *contributing* causes to atrophy of the nasal tissues, but granted this, I cannot see how it can be reasonable to believe that sinusitis is the sole or usual cause of the atrophic process. In this acute form, the inflammatory condition is very much more active than the chronic, because it is attacking young, healthy nostrils, and probably a large number of virulent bacilli of various forms are engaged in the process of degeneration.

A chronic atrophic rhinitis is the ordinary form of disease so familiar to all.

Now a few words in regard to the general etiology. It seems to me that it is of very little use to discuss at great length the relations between hypertrophic and atrophic rhinitis. Even if it is admitted that the atrophic process follows the hypertrophic one in the majority of instances, such admission throws no light on the etiology of atrophic catarrh. Why should atrophy follow hypertrophy only once in twenty or thirty or forty of the hypertrophic cases and not be present in the larger remaining number. It is of little interest to say that there is in this disease atrophy of the blood vessels, nerves, muciparous folicles due to sclerosis because we know all this to be true, but why should such a process progress in one case out of twenty or thirty, and not in the others which are exposed to the same climatic conditions?

Etiological factors are commonly divided into two classes, exciting and predisposing. We think there are many predisposing, or, as I much prefer the term, contributing causes, which aid in producing an atrophic process, but in weighing the relative potency of the many contributing causes, it will be found difficult to state which is the most active. On the other hand, there may be, properly speaking, no exciting cause, and perhaps the sum total of all the contributary causes are sufficient to produce the disease. If there is one exciting cause, it must be some special bacillus; that is, the disease must primarily be of microbic origin. This remains to be proven.

It is interesting to consider the contributary causes, because I believe they are all important in the production of this disease, and I will mention some of them. They are heredity, occupation, sex, age, lack of nasal and general hygiene, all forms of nasal obstruction, including adenoids and sinus disease. It is unnecessary to speak of these, point by point. Just here it occurs to me to say that I think atrophic rhinitis is disappearing in frequency. We certainly see fewer cases than in the old days and we believe that this is explained by the fact that nasal diseases are better understood and better taken care of. Even the careless patient, or the patient of little means, takes pains to get instruction as to the proper methods of washing and oiling the nose. Again, I believe we see far more cases of atrophic rhinitis in our clinics than in our private practice, which proves that want of care or want of cleanliness and living under improper sanitary conditions have much to do with the causation of this disease.

I have long felt that heredity was a strong etiological factor because my observation has proven this, all children of one family showing the same atrophic tendency. I believe that people are born with nostrils so badly nourished in matter of blood and nerve supply, that atrophy readily takes place when the nasal chambers are attacked by some special bacillus or when the mucous surfaces are irritated by nasal obstruction, congestion or purulent discharge from the sinuses. I consider the Herd or Gruenwald theory of the causation of atrophic rhinitis, that it is produced by empyena of the sinuses simply one of the several contributing causes. It probably is not as important as the matter of *heredity* which means the lack of resisting power of the mucous membranes of those people who suffer from this disease.

This proneness in some people to atrophy has its analogy in other parts of the body and in other forms of disease. We ought to say a word about the conditions of living and occupation. I have already said that this disease is much more frequently seen in clinics than in private practice and I consider this a significant point, not only in directing our attention toward etiology, but in suggesting treatment. I said in a paper on the treatment of atrophic rhinitis written in 1897, that I am willing to be frank enough at the outset to say that if it were left to me to select as between the value of the benefit to be obtained in the treatment of atrophic rhinitis by the use of all the local medications which have been employed, or, on the other hand, if I were given the opportunity to put my patient at out-of-door work and under favorable hygienic and sanitary conditions, I certainly should choose the latter expedient, asking only that the patient should be instructed to cleanse the nose with a suitable wash. I consider, therefore, that dirt in the atmosphere, uncleanly habits in living, are very potent factors in the etiology of atrophic catarrh. The too liberal use of alcoholic stimulants and of cigarettes especially are contributory causes to dryness of the nose and pharynx.

To sum up my belief as to etiology, I will say that it is very probable that it will be found that the exciting causes of this atrophic disease is some form of bacteria, and we would place first and most important among the contributory causes a heredity or congenital inherent feeble condition of the mucous membrane. Among the many forms of nasal disorder, contributing to atrophic rhinitis, perhaps the most potent is a double sinusitis associated with grippe or eruptive disease. Thirdly, poverty, unhealthful personal conditions and working and living amidst unsanitary surroundings.

As to treatment: In my article on atrophic rhinitis, written some years ago, I stated the necessity of taking people suffering from this disease away from cities and unhealthful surroundings, and putting them at out-of-door work in the country. At that time I had the opportunity of sending eight persons, men and boys, who were suffering from advanced atrophic diseases, to a stock farm in New Jersey where they were employed as ordinary farm hands. They were taken from factories and workshops, and they had been treated by the ordinary remedies with little relief. The improvement in all these cases was most gratifying and I advocated at that time that it was the duty of the physician and community at large to send cases of atrophic nasal diseases to country farms whenever it was possible to do so. My belief in the efficacy of this treatment remains unchanged.

In conclusion I would say that I do not consider the prognosis in these cases nearly as discouraging as I formerly did, because I have seen so many patients who although washing and oiling the nasal chambers once or twice a day, express themselves as perfectly comfortable, and the patient's comfort is of more importance than a normal appearing mucous membrane.

It was Zeim who ordered his patients to the sea-shore or to the woods for a certain time each day in order that they might, as he expressed it, thoroughly ventilate their nostrils.

123 East Nineteenth Street.

THE ADVANTAGES AND DISADVANTAGES OF THE ENDO-NASAL METHOD OF OPERATING FOR EMPYEMA OF THE FRONTAL SINUS.

BY ROSS HALL SKILLERN, M. D., PHILADELPHIA.

Since the comparatively recent development of Rhinology to one of the foremost specialties of the day, the number of Rhinologists using, or who have made use of this procedure appear to be exceedingly small in relation to those performing the external operations.

Diffenbach[1] appears to have been the first one to puncture the frontal sinus through the nose, which he accomplished by means of a pair of straight forceps. Schaeffer,[2] of Bremen, after a lapse of forty-two years, practised the method according to his own theory. The results appear to have been doubtful and after the investigations of Grunwald[3] and Hajek[4] fell into disrepute in spite of the fact that Winkler,[5] through his anatomical investigations, attempted to justify the method as being sound and practical.

Myles[6] states that he originated the idea of taking out all of the bone between the central part of the nasal process and the frontal sinus as near the floor as possible and has operated on several cases in that way, keeping the sinus open for six weeks. He abandoned this operation because he could not chisel away the floor of the sinus through this opening, and it was difficult to enlarge the opening to the proper extent.

I have carefully reviewed the literature for the past fifteen years but failed to find a detailed account of this procedure. However, at the meeting of the Section on Laryngology of the A. M. A. in 1904, Myles stated that his "most brilliant results in the treatment of empyema of the frontal sinus have been accomplished through removal of the anterior ethmoidal cells and part of the floor of the frontal sinus through the nose." The technique of the operation, however, is not stated.

Spiess[7] further developed the operation, using the X-Ray, which enabled him to follow the course of his boring instrument through the ductus-frontalis into the sinus.

Ingals[8] uses a sound conductor which is first passed into the sinus a hollow burr is then slipped over this conductor, the electric current turned on, and the instrument easily penetrates into the sinus.

Halle[9] protects the posterior wall of the sinus by means of a grooved instrument and removes the antero-superior nasal spine with an electric bore. These methods, particularly the latter procedures of Ingalls and Halle will now be considered more in detail.

Schaeffer[2] says: "A two mm. thick, strong but flexible steel sound is carried along the dorsum of the nose between the septum and middle turbinate directly toward the floor of the frontal sinus. The sound being pushed steadily upward, a fine crackling sound is soon heard as though thin plates of bone were being broken. A strong resistance is felt, but the sound is further pushed until finally one has the feeling as though it had penetrated into a cavity. Two to four teaspoonsful of blood flow out of the nose following its entrance. A discussion of this method is superfluous.

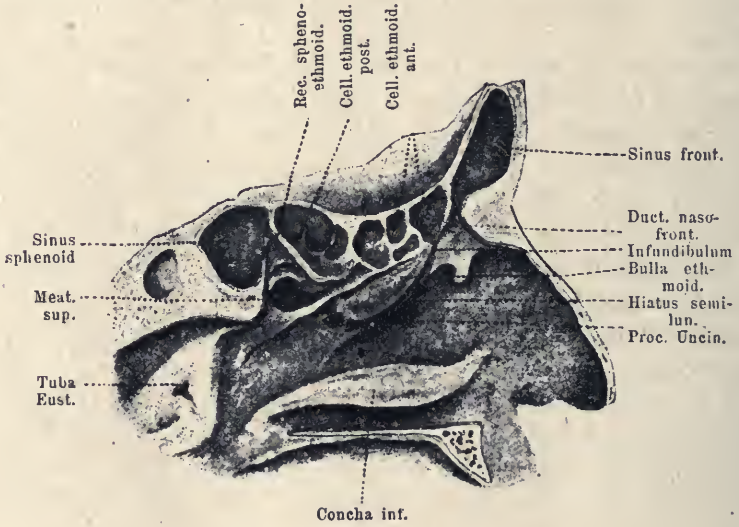

Fig. 1.

Spiess[7] used a borer three mm. in diameter in the form of a half-circle (believing that it bores more quickly and does not become heated), and subsequently enlarged the opening toward the sides and especially posteriorly one-half mm. with a fraise of the same dimensions. Sometimes it is necessary to interrupt the operation for short intervals when the antero-superior nasal spine is very thick. He warns that it is necessary to hold the handle of the instrument with both hands lest it suddenly glide into the sinus and strike the posterior wall. Spiess himself states that the method is not reliable from a therapeutic standpoint except in cases of acute empyema.

The objections to this method are—

(1) The ever present danger of injuring the posterior wall of the sinus owing to one being unable to control the sudden slipping of the instrument into the sinus.

(2) In acute empyema it is probably superfluous as the disease practically always heals after the various conservative methods (scarification of anterior end of middle turbinate, resection of anterior end and washing out of sinus, etc.)

(3) Necessity of the presence of a large X-Ray machine.

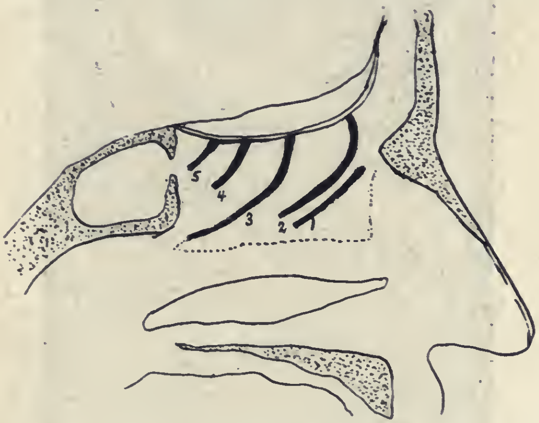

Fig. 2. (1) Lamella of Processus Uncinatus. (2) Lamella of Bulla Ethmoidalis. (3) Lamella of Middle Turbinate. (4) Lamella of Superior Turbinate. (5) Lamella of Fourth Turbinate.

Ingals[8] method: A steel pilot similar to a sound is introduced into the frontal sinus, a hollow burr with a flexible sheath is slipped over it and the chuck attached to a dental engine. Gentle continuous pressure is then made and in a few seconds the frontal sinus has been entered. After the sinus has been cleasned, a strip of gauze, saturated with ninety-five per cent carbolic acid, or a ten to twenty per cent solution chloride of zinc is introduced by means of a gauze packer and allowed to remain a few minutes. A gold tube is then placed in the canal and allowed to remain, thus completing the operation.

The advantages and disadvantages of this method may be enumerated as follows:

ADVANTAGES.

(1) It may be valuable from a diagnostic point of view, i. e., shut in empyema of the frontal sinus.

(2) The operation is indicated when it is not possible to wash out the sinus even after removal of the interior portion of middle turbinate

DISADVANTAGES.

(1) The anterior ethmoidal cells are practically always diseased and it is not only possible but very probable that the side of the gold tube would occlude their ostii and lead to further complications.

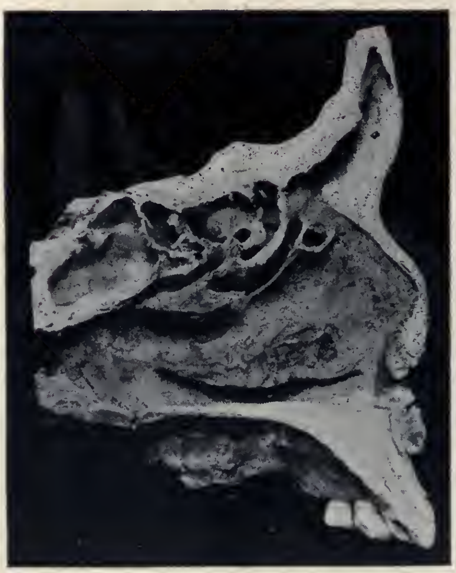

Fig. 3. From the collection of Dr. M. H. Cryer.

(2) There is some danger of wounding the posterior wall, [9] [10] [11] lamina cribosa or lamina papyracea[10] by a lateral grinding action of the burr, in spite of Dr. Ingals' assertion to the contrary. (See anatomical disadvantages.)

(3) The operation is useless when the mucous membrane has undergone great degenerative changes.

(4) The operation may be likened to Cooper's operation on the maxillary sinus with its disadvantages, i. e., the great tendency of the opening to close. If granulations form around a prothese in the alveolus, why would they not form around the gold tube of Ingals in the ostium frontale, especially when the mucous mem-

brane has been cauterized with a ninety-five per cent carbolic acid or a ten to twenty per cent solution of chloride of zinc?[12]

Halle's method[9] (quoted): "I introduce a probe as high as possible into the frontal cavity. Over the probe I slide a protector of soft, flexible metal somewhat in the manner that Stacke guides his protector into the attic, which adujsts itself to the tabula interna posteriorly and to the orbit laterally. After that I remove the probe. If I now advance with a bore drill worked by electricity immediately alongside of this protector in a forward and upward direction, taking care to keep always close to the protector, I can go up to the front and center without any danger at all, and open the floor of the cavity which is formed by the spina naso-frontalis, to such an extent that I obtain an opening sufficiently large to admit a drill with a blunted point. The sharp instrument is to be used only up to this time. When this is achieved, I can easily and, because of the carefully polished point of the drill, without danger to the tabula interna, enlarge the opening suffuciently to introduce into the cavity a pear-shaped drill. whose thickened portion is carefully rounded off and polished. With this instrument no dangerous injuries can be caused, provided the least care is taken. The entire floor can be drilled away with it, and so large a part

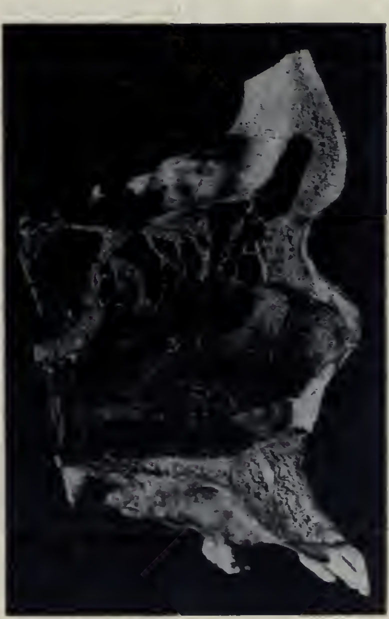

Fig. 4. From the collection of Dr. M. H. Cryer.

of the tabula externa ossis frontalis in a downward direction that the instrument can be felt from without, and that the opening of the frontal cavity towards the nose becomes almost as large as the distance of the nasal base from the tabula interna."

If we likened Ingals' method to Cooper's, Halle's may be compared to the Krause-Mikulicz on the antrum.

Regarding the application of the method, I might suggest that Dr. Halle has given us an illustration of an idealistically normal frontal sinus in Fig. 1. If all our cases were anatomically constructed in such a manner, the procedure of Halle would gladly be practiced by every Rhinologist of to-day. Unfortunately such is not the case. (See anatomical disadvantages.)

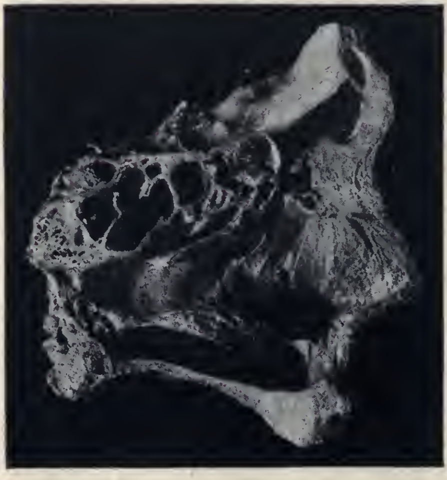

Fig. 5. From the collection of Dr. M. H. Cryer.

ADVANTAGES.

(1) A much larger communication between the sinus and nose is established than by any other endo-nasal operation.

(2) The operation is performed with straight instruments, the boring being done under guidance of the eye.

(3) Should an external operation subsequently be found necessary, an important step in that operation will have already been performed, i. e., the large communication with the nose.

(4) If a small sinus is present, all portions being accessible, the cure should be absolute.

DISADVANTAGES.

The operation in acute cases will undoubtedly effect a cure but so will far milder measures in the vast majority of instances.

Concerning chronic cases, it depends upon the condition of the mucous membrane, the extent and shape of the sinus, the presence of necrosed or necrosing bone, and the presence of remote pockets of pus. As Jansen[13] well puts it, "Only a comparatively small portion of the sinus can be reached by the endo-nasal method, and the remaining part may retain granulation tissue, thickened membrane, necrotic bone and even a pocket of pus."

Disadvantages of the endo-nasal route from an anatomical point of view: A normal infundibulum from a rhinological point of view seldom exists and when it does occur, may be classed as an anomaly.

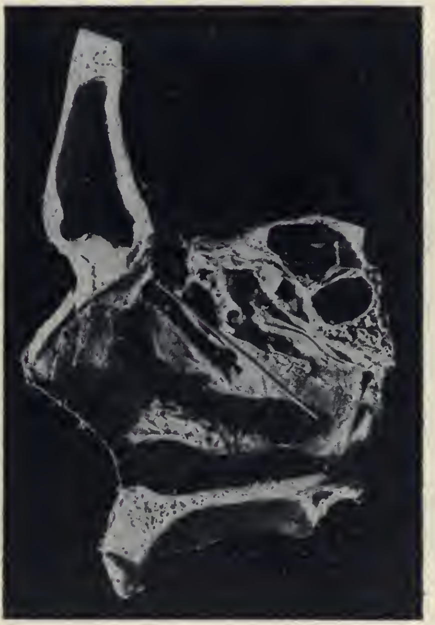

Fig. 6. From the collecion of Dr. M. H. Cryer.

By a normal infundibulum I refer to the conditions where:

(1) The ground lamella of the bulla ethmoidalis reaches the lamina cribrosa, forming a perfect arc (Fig. 1), all the ethmoid cells lying posterior to it.

(2) Where the ground lamella of the proscessus uncinatus at its junction with the ground lamella of the bulla, forms a hollow and lies against the lamina papyracea thereby conforming with the depth of the hiatus semilunaris, thus prohibiting the interpo-

sition of an infundibular cell, which occurs so frequently at this point.

(3) The posterior or cerebral wall of the frontal sinus meets the lamina cribrosa at such an angle that it forms a continuous line with the ground lamella of the bulla ethmoidalis.

(4) The antero-superior nasal spine occupies the normal position and is evenly developed as regards size and shape.

Thus the boundaries of this idealistically normal infundibulum would be: Anteriorly, antero-superior nasal spine (above), processus uncinatus (below).

Externally, lamina papyracea.

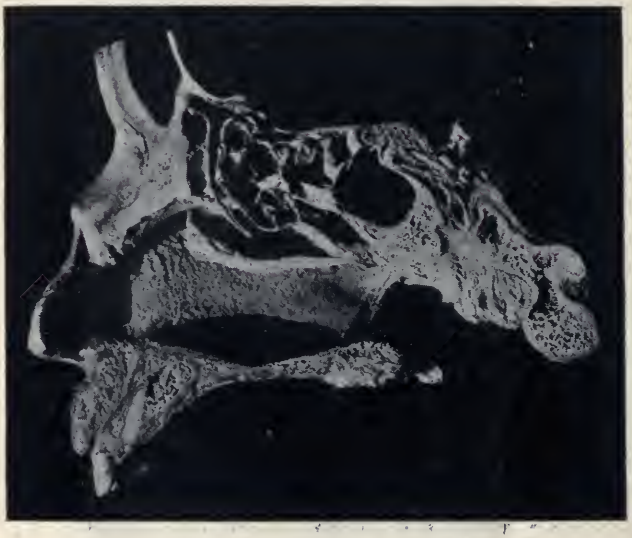

Fig. 7. From the collection of Dr. M. H. Cryer.

Posteriorly, ground lamella of bulla ethmoidalis.

Internally, external surface of anterior portion of middle turbinate.

Were this anatomical construction always constant we would invariably have a landmark for the position of the internal wall of the frontal sinus (lamella or bulla), as well as one for the lamina papyracea (external wall of infundibulum), thus making the technique of an endo-nasal operation on the frontal sinus dependent on a thorough knowledge of the anatomical construction of the part.

Unfortunately this, to all intents and purposes, is never present. Every conceivable variation and deviation of these structures may be met with when least expected. Zuckerkandl,[14] referring to the ostium frontale as well as the upper part of the infundibulum, says that he has never seen a typical formation of both parts occurring together. Indeed, one can hardly speak of slight anomalies in this region, they are the rule rather than the exception.

The position of the bulla ethmoidalis plays the most important role in these anomalies, all other deviations from the normal are dependent and subsidary to this (Fig. 2). If it is situated too far forward, it holds its place naturally at the expense of the structures situated anteriorally (hiatus semi-lunaris, ductus naso-frontalis, ostium frontale and processus uncinatus), if situated further posteriorly than normal, something must occupy the otherwise empty space between it and the ostium frontale. When this occurs, the ostium of a pushed forward ethmoid cell (vorgeschobene Siebbeinzelle), commonly called orbital cell, occupies this space. The position of this ostium in relation to the ostium of the frontal sinus, is also by no means constant; usually it takes a position directly posterior to it. It is this ostium which our sound often enters, simulating the exact position of the frontal sinus and is exceedingly confusing, even though the condition be suspected. The X-Ray will, however, make this point clear. The size of the hiatus depends largely upon the position of this bulla lamella and may be from the size of a thread to 4 mm. in breadth.

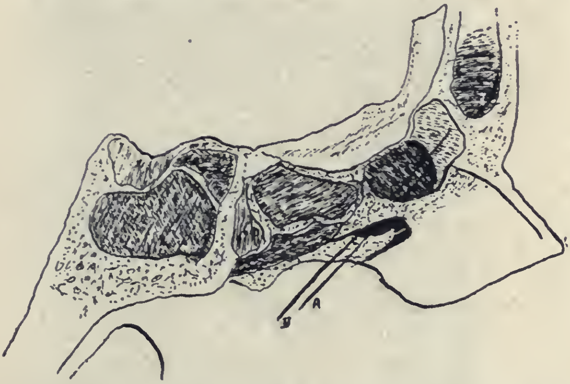

Fig. 8.—Defect in the bulla lamella, showing an extensive communication of the ductus naso-frontalis with the anterior ethmoidal labyrinth (Hajek). a.—Sound introduced into the infundibulum, which passes through a large anterior ethmoidal cell before entering the frontal sinus. b.—Sound introduced into the infundibulum passing into an anterior ethmoidal cell.

The most common forms of deviation from the so-called normal are as follows:

(1) The lamellae of the processus uncinatus and bulla are situated directly under the frontal sinus. The connecting lamella between the (proscessus uncinatus and bulla), instead of adhering to the lamina papyracea, bridges directly over the infundibulum, thus forming a blind ending to the hiatus semi-lunaris (Fig. 3). This ending may take on such dimensions as to protrude considerably into the frontal sinus and in this case, lies on a line but internally and above this blind pouch or infundibular cell. This construction would be eminently adaptable for both the Ingals and Halle operation except in those cases where a large bulla frontalis was present, which might cause some difficulty with the Ingals operation, as the probe could easily enter the bulla instead of the sinus proper. The burr of Ingals only cutting laterally would not penetrate this bulla, especially if the walls were inclined to be thick.

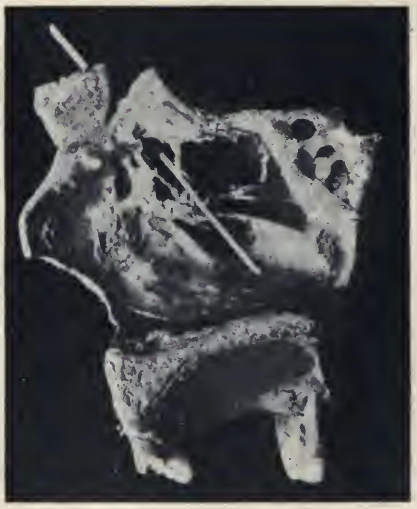

Fig. 9. From the author's collection.

(2) The lamella of the bulla and proscessus uncinatus, instead of being situated directly under the sinus, assume an obtuse angle in relation to it, the depth of the infundibulum and the position of the ostium frontale being inconstant (Fig 4, Fig. 5), Tilley [15] states: "The depth of the infundibulum from the anterior surface varies very much and may be situated at a depth of twenty-eight millimeters from the anterior surface of the bone. The direction and potency of the frontal-nasal passage varies very much. In many cases it would be impossible to enter the frontal from the nose without making a false passage."

The variations of this construction are manifold, being dependent upon the completeness of the bulla lamella. As it appears to be the rule rather than the exception for the anterior superior portion of this lamella either to assume an anomalous position or partially fail, one can readily perceive the conspicuous role it plays in the construction of the osteum frontale, ductus naso-frontalis (when present), and adjacent parts.

I see no reason why this construction is not adaptable to either the Ingals or Halle operation except in those cases mentioned by Tilley where it would be impossible to enter the sinus without making a false passage. A possible objection to the Ingals' operation in this construction is: The probe might lie against the lamina papyracea as well as the posterior wall of the sinus, the burr cutting through laterally as it made its way into the sinus.

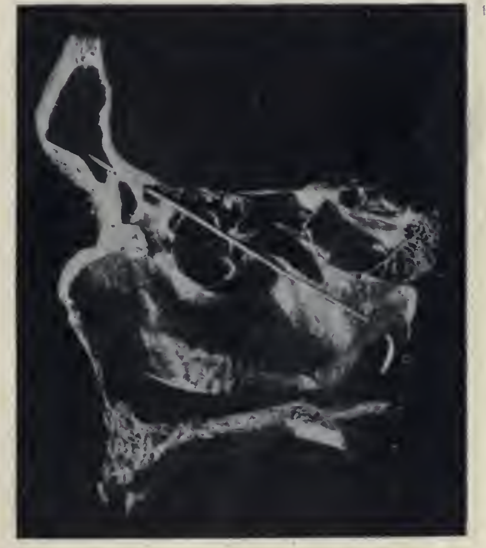

Fig. 10. From the collection of Dr. M. H. Cryer.

(3) The lamella of the bulla is pushed forward, leaving an abnormally large space between it and the lamella of the middle turbinate; this space being occupied by a large ethmoidal cell extendingly far up behind the posterior wall of the frontal sinus (Fig. 6.)

Ingals' operation could easily be performed here with no danger, while Halle's operation would necessitate the removal of a large portion of the anterior ethmoidal labyrinth.

(4) A portion of the anterior ethmoidal labyrinth is pushed forward in front of the ground lamella of the bulla covering the hiatus semi-lunaris from its medial and frontal aspect, thereby surrounding the entire ductus naso-frontalis with ethmoidal cells (Fig. 7, Fig. 4.)

As it would be impossible to accurately ascertain even by the X-Ray whether the sound had penetrated the frontal sinus or a large anterior ethmoidal cell, both Ingals' and Halle's procedures would require the greatest caution in their application.

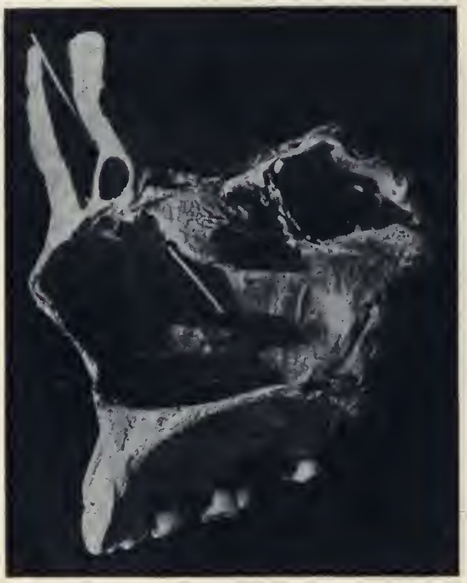

Fig. 11. From the collection of Dr. M. H. Cryer.

In Fig. 4, Halle's procedure would be less desirable than Ingals', owing to the small breadth of the floor of the frontal sinus, it reaching in this case hardly one centimeter.

(5) This condition is due to a defect in the lamella of the bulla. The sound entering the hiatus passes through a large ethmoidal cell before it enters the ostium frontale. Under such circumstances it would be difficult to make a positive diagnosis of frontal sinus empyema.

An endo-nasal operation here would at least be exceedingly difficult.

(6) The antero-superior part of the hiatus is obliterated by the coaptation of the bulla lamella with the proscessus uncinatus.

Strictly speaking, the frontal sinus is absent, its place being filled by an anterior ethmoidal cell which does not communicate with the hiatus semi-lunaris but empties into a neighboring ethmoid cell. (Fig. 9 and Fig. 10.)

(7) The ground lamella of the bulla unites with that of the proscessus uncinatus low down, thereby shortening the hiatus to one centimeter. The anterior part, however, is in direct communication with the frontal sinus through a long ductus naso-frontalis.

The normal position of the anterior end of the hiatus is occupied by the ostium of an ethmoid cell which leads to the crista galli (Fig. 11). It would be exceedingly difficult to ascertain whether the sound had entered the frontal sinus even by means of the X-Ray, therefore I am of the opinion that the endo-nasal operation is here contra-indicated.

While I am free to confess, the latter anomalies are not frequently encountered, nevertheless they must always be taken into consideration. Even with the middle turbinate resected, one has no clue as to the construction of the naso-frontal structures and must be guided almost solely by touch in the individual cases as they present themselves. Speaking of the frontal sinus and its variations, Cryer[16] states: "If a thousand skulls of persons affected with diseased pneumatic sinuses were examined, the variations would be found much greater and more common than one thousand skulls examined by sectioning in our dissecting rooms."

The importance of X-Ray pictures before an endo-nasal procedure in this vicinity cannot be over estimated.

General advantages and disadvantages of this method:

It is well to try the Halle method in certain selected chronic cases (latent empyema), as we would try the Krause-Mikulicz before the Luc-Caldwell on the maxillary sinus which offers the advantage of the lesser really being a step in the greater operation. If the Halle has been performed and a Killian subsequently found necessary, a difficult step in the operation will have already been performed, i. e., the establishment of a wide communication with the nose.

A point to be considered is the totally different aspect in which the American race look at scars and deformities, and, for example, the Germans. Where a cosmetic result according to a German would be "blameless," here it would be looked upon as an unsightly scar. In America the endo-nasal method is far preferable, at least as far as the patient is concerned. Social position and sex also play an important part in determining which method we shall use.

CONCLUSIONS.

Endo-nasal frontal operation indicated in:

(1) All cases of acute empyema with urgent symptoms where the usual conservative methods have been tried, with no relief to the patient. (Ingals' operation.)

(2) Acute cases where removal of anterior end of middle turbinate and washing out does not appear to be affecting a cure. (Ingals' operation.)

(3) Cases of chronic empyema where a small sinus is present. (Halle operation.)

(4) Cases of chronic empyema regardless of the size of the sinus where one has reason to believe no great pathological changes have taken place in the mucous membrane. (Halle operation.)

(5) In any case where for cosmetic reasons it is necessary to give the patient the benefit of the doubt.

Endo-nasal frontal operation contra-indicated.

(1) When it is not possible to pass a sound into the sinus.

(2) In abscess and fistula formations.

(3) When intra-cranial complications are suspected.

Endo-nasal frontal operation will probably be unavailing where:

(1) Great pathological changes have taken place in the mucous membrane of the sinus.

(2) Numerous ramifications and partial septa are present in the sinus.

(3) Large pushed forward (orbital) ethmoid cells are present which are likewise diseased.

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HEMORRHAGE FOLLOWING QUINSY. LIGATION OF THE COMMON CAROTID ARTERY: RECOVERY. WITH A STUDY OF 51 CASES OF HEMORRHAGE IN CONNECTION WITH PHARYNGEAL SUPPURATION.

BY JAMES E. NEWCOMB, M. D., NEW YORK CITY.

The title of this paper has been so worded as to include cases which have been reported under various headings, and to permit a proper grouping of them. The majority of the hemorrhages have occurred in connection with ordinary quinsy. The subject was brought to the attention of this Association in 1900 by Dr. W. F. Chappell, who reported a case under the title of "Hemorrhage from a Circumtonsillar Abscess," and stated that he had found ten similar cases recorded. (Transactions, 1900, page 213). The personal experience of the writer hereinafter described has led him to make an extended study of the matter, and fifty cases in all have come to light. In proportion to the vast number of cases of this malady which run their clinical course without untoward incident, the number of those with hemorrhages is manifestly extremely small, but the alarming possibilities which this complication presents render it obligatory upon us always to bear it in mind and in case it happens, to have a well-considered plan of procedure.

Through the courtesy of Dr. John D. McBarron, I am able to report the following case seen in consultation with him.

The patient was a stout plethoric German, 55 years of age, married and well to do. He lived very comfortably, and was a rather free consumer of alcohol. His vessels showed distinct arteriosclerosis. There was no history or evidence of specific disease and his urine, which had been examined within six months, showed no evidence of renal trouble. For a period of between thirty-five and forty years, he had had numerous quinsies, and in the intervals between his attacks much treatment with reference to preventing recurrence of his throat infection. This had been so far successful that he had enjoyed an immunity for ten years. In none of the previous attacks had there been any clinical features out of the ordinary.

On February 3d of the present year a new attack came on, and Dr. McBarron found both tonsils inflamed and suspected commenc-

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*Paper read at the Thirtieth Annual Congress of the American Laryngological Association held at Montreal, Canada, May 11-13,1908.

ing suppuration. On February 6th local conditions indicated a pointing of pus on the left side, rather far out into the soft palate. An incision was made, the knife going through brawny tissue for about three-eighths of an inch, and then, apparently, entering a cavity, which, on withdrawal of the blade, voided about a dram of healthy-looking odorless pus, and partially collapsed, but almost immediately became distended with blood, some of which was spat out and was apparently venous. The incision was enlarged with a stiff probe, the clots turned out, various astringents used, per-oxide injected and the bleeding ceased.

Some thirty-six hours later, just as Dr. McBarron was in the house visiting his patient, the bleeding recurred, and this time the color of the blood was distinctly arterial. It was at this stage that the writer was called in. The blood was coming from the original pus cavity. Bleeding was not severe, but persistent. The cavity was cleansed and packed with a strip of gauze dipped in a solution of aceto-tartrate of alum. Bleeding was again checked. The gauze was removed the next morning without incident. Some fourteen hours later, bleeding recurred, and was now more persistent and in increased amount. Another attempt was made to pack the cavity, which was mainly in the soft palate, when it was discovered that the suppurative process had perforated the posterior surface of the palate and that the gauze was all going into the pharynx. It was withdrawn, and recourse had to ice internally and externally, together with the usual local applications, but all to no avail. Hemorrhage continued at intervals, although the total amount lost was not enough to exhaust the patient; but he had become pretty well demoralized from loss of sleep during the days of his illness, and from the fact that he had been unable to swallow but scanty nourishment.

It was now evident that something more radical must be done for we were unable to feel any security against the occurrence of what might be an alarming hemorrhage. It was impossible to locate the exact source of bleeding, and the sloughing condition of the entire area affected rendered any plan of suturing out of the question. The question of ligating one of the large arteries came up, and Dr. Charles N. Dowd, a general surgeon of our city, was called in. After a full consideration it was decided to ligate the common carotid artery on the side involved, and this was done about nine o'clock on the morning of February 9th. The patient's habits, with reference to alcohol, made the giving of an anaesthetic a very difficult procedure, but it was carried out in a masterly manner by Dr. Thomas G. Bennett. Chloroform was used, and after the man was fairly under its influence, stiff rubber tubes were passed through the nares, their proximal ends loosely wrapped with gauze on which the chloroform was poured, and the pharynx stuffed with gauze. This prevented the leakage of blood down the throat during the ligation of the artery. The latter was done by Dr. Dowd without incident. Two ligatures were passed, one with single strand and one with double, about half an inch apart. As soon as they were tightened, the bleeding instantly ceased and never returned. The patient made a good recovery from the operation. There was no disturbance of cerebration. He complained of considerable neuralgic pain all over the head, and had difficulty in sleeping at night. These symptoms were successfully combatted with the usual remedies, and a perfect eventual recovery ensued. About three weeks after operation a pulse could be detected in the left temporal region.

A careful and profound search through the literature has brought to light fifty additional cases which may properly be placed under the title selected for this paper. As always happens in a collation of cases extending over a long period of years, classification is somewhat difficult, as each reporter has followed his own ideas in setting forth the particulars of his own experience. It seems logical to make of the material here presented the following subdivisions:

GROUP I.

Spontaneous opening of the abscess; immediate hemorrhage.

A. Fatal cases.

Caytan; male, 38 years, no operation, ulceration of the internal carotid.

Grisolle; no particulars given; no operation, ulceration of the internal carotid.

Léfort; no particulars given; no operation; bleeding believed to have come from the internal carotid.

Méry; no particulars, no operation, abscess led to ulceration of the internal carotid.

Macgregor; male, 20 years, no operation; tumor appeared in right side of neck, running down to the mastoid process, autopsy revealed a circumtonsillar abscess, communicating with the internal carotid by an opening the size of a small bougie.

Monod; male, 38 years, no operation, probable ulceration of internal carotid.

Norton; female, 4 years, no operation; incision of abscess was refused by parents. Autopsy revealed ulceration of internal carotid.

B. Recoveries.

Dunn; child 3½ years, bleeding immediate and recurred 24 hours later; cervical haematoma; ligation of common carotid, after which tumor gradually decreased in size; bleeding was seen to come from the posterior faucial pillar.

Luke; no particulars, bleeding immediate and recurrent, ligation of common (?) carotid.

Messiter; male, 24 years, immediate bleeding, profuse and recurrent; initial hemorrhage on 4th day of a quinsy and recurrence on the 19th day. Ligation of common carotid.

Pircher; male, 22 years, bleeding immediate and recurrent, ligation of common carotid; definite statement that no bad effects followed the operation.

Summary of Group 1: Eleven cases, seven fatalities and four recoveries.

GROUP 2.

Spontaneous opening of the abscess; secondary hemorrhage.

A. Fatal Cases.

Bourguet; male, 20 years, bleeding recurrent, no operation.

Brewer; male, 25 years, small immediate and later recurrent hemorrhage, no operation; an effort was made to secure pressure against the posterior surface of the soft palate by means of a small roll of gauze to which were attached tapes coming out through the nares. Arrest of hemorrhage for a while, but later fatal recurrence; supposed rupture of a small abscess on the posterior surface of the soft palate.

Clayton: no particulars, no operation, ulceration of internal carotid.

Hall; male, 26 years; bleeding came on two hours after the abscess burst. Fatality probably due to rupture of a carotid aneurism as a few minutes previously the patient had complained of a "balloon-like" feeling in his throat; no operation.

Mueller; male, 44 years, recurrent pus and blood, no operation Autopsy showed facial artery thinned and ulcerated; cavity full of pus at bottom of left tonsil.

Reeves; few particulars, hemorrhage same day as opening of abscess and recurrent. Operation proposed, but refused.

Vergeley; male, 34 years; blood and sphacelus on bursting of abscess, and again a few hours later; operation refused; autopsy showed in retro-tonsillar space a cavity the size of a pigeon's egg, full of clots and sphacelus; internal carotid trunk cleanly severed about two inches from bifurcation of the common trunk.

Walker; few particulars, hemorrhage 48 hours after abscess burst; tumor formed along right side thyroid cartilage; communicating with abscess; no operation.

B. Recoveries.

Ehrmann; male, 22 years, hemorrhage on the eighth—ninth day, ligature common carotid; supposed lesion of internal carotid.

Moizard; male, 40 years, large hemorrhage in twenty-four hours causing syncope, which checked bleeding; clot seen in situ in vessel wall; no operation; ether, ergotin hypodermically, rest and carotid compression.

Marotte; male, 30 years, hemorrhage in forty-eight hours; no operation; large doses of quinine given for some days.

Postempski; male, adult, hemorrhage twenty-four hours after bursting of abscess; ligation of common carotid artery; suspected lesion of internal carotid.

Stoupy; male, 22 years, hemorrhage on 8th day, ligature of external carotid; massive inflammation had appeared in region of submaxillary gland; incision for ligature encroached on this area and gave exit to considerable clotted blood, and in spite of ligature external bleeding continued for a while, but patient eventually recovered.

Veillard; male, 26 years; recurrent hemorrhage some hours after abscess burst and recurrences; no operation, ice and rest.

Weinlechner; male, 37 years, hemorrhage two days after abscess opened; ligature of common carotid, with immediate recovery, but evidences of disturbed muscular power appeared on the opposite of the body: In six weeks this had nearly disappeared; later death from apoplexy.

Summary of Group 2: Fifteen cases, eight fatalities and seven recoveries.

GROUP 3.

Abscess opened by incision; immediate hemorrhage.

A. Fatal cases.

Duke; male, 32 years; pulsatile tumor had appeared in tonsillar region; ligature of common carotid immediately stopping pulsation; ligature came away on the sixteenth day, and on the twenty-first day the man appeared perfectly well and was dismissed; one week later he went on a debauch and had a fatal hemorrhage.

Lebram: (second case), male 2 years, no operation, bleeding also from ear.

Fehleisen; male, 34 years; after incision clots were turned out of abscess cavity, but threatening dyspnoea necessitated tracheotomy during which patient died; swelling had appeared at angle of jaw following angina with fluctuation over it; internal structures were pressed toward middle line; no bruit or pulsation in pharynx; carotid vessels were found lying in purulent foci and perforated at bifurcation.

Liston; incomplete report; ligation of common carotid which did not control hemorrhage.

B. Recoveries.

Lebram; (first case), female, 9 years, hemorrhage from pharynx, nose and ear; ligature of common carotid; hemiplegia followed ligature.

Long; incomplete report; free bleeding followed incision; later, patient was found choking, and was resuscitated with great difficulty; no operation.

McBarron: (case reported in this paper), male, 55 years, hemorrhage immediate and recurrent; arterio-sclerosis; ligature common carotid.

Summary of Group 3: Seven cases; four fatalities, three recoveries.

GROUP 4.

Abscess opened by incision; secondary hemorrhage.

A. Fatal cases.

Pitts; male, 39 years; hemorrhage twenty-four hours after incision and recurrent; ligation common carotid; autopsy showed left tonsil replaced by cavity and the internal face of the internal carotid bathed in pus with a perforation the size of the tip of the little finger.

Watson; incomplete report; hemorrhage forty-eight hours after incision; ulceration of lingual artery found.

(In this category it seems proper to include two cases reported by Kaplan, although they did not present the usual clinical features of an ordinary quinsy. The incisions in these cases were made externally, but both cases have been reported as hemorrhage, due to circumtonsillar abscess. The surgical conditions, and especially the problems they offered make this classification here followed logical. For a summarized history of the cases taken from their original source of publication in one of the Russian journals, I am under obligations to Dr. S. M. Jacobs of New York.)

Kaplan; (first case), male, 22 years; a fluctuating swelling the size of an egg, appeared at the angle of the jaw externally, tonsil red and inflamed; incision revealed a deep pus cavity leading toward throat; wound did well for thirteen days and then bled most profusely; ligature of common carotid; paralysis of arm and leg of opposite side; ten days later paralysis much better, but patient lost consciousness and died with slight convulsion of paralyzed side; hemorrhagic pleurisy.

Kaplan; (second case), male, 19 years; tumor at angle of jaw; incised and pus found burrowing toward pharngeal wall; same day cyanosis choking, tracheotomy with temporary improvement; forty-eight hours later, sudden hemorrhage from wound, nose and mouth; ligature of common carotid immediately checked it; patient regained consciousness, but soon became comatose and died; perforation found in internal carotid:

B. Recoveries.

Borbone; incomplete report; hemorrhage the day following incision.

Chappell; male, 27 years, hemorrhage fourth day and recurrent, controlled by packing; no operation.

Gleitsmann; male, 24 years, hemorrhage eighth day and recurrent; styptic packing controlled; no operation.

Schmiegelow; male, 30 years, hemorrhage fourth day; ice, rest and morphine controlled probable lesion of a twig of the tonsillar or ascending pharyngeal artery.

Summary of Group 4: Eight cases, four fatalities and four recoveries.

As far as reports show all of the cases in the foregoing groups were quinsies. Additional cases have been reported which may be grouped as follows:

GROUP 5.

Hemorrhage following retro-pharyngeal abscess.

Carmichel; male, 5 weeks, immediate hemorrhage following the opening of the abscess; no operation, death; abscess found to connect with posterior tonsillar cavity; bleeding from a branch of the external carotid.

Clutton; male, 28 years; spontaneous opening of abscess; hemorrhage immediate and recurrent; ligation of common carotid, and of its external, and internal branches, recovery; blood thought to have come from the internal jugular vein; abscess appeared to focus above the right tonsil.

Erichsen; incompete report; phlegmon in pharynx discharged pure pus; on seventh day fatal bleeding from abscess cavity; autopsy revealed abscess bordering wall of internal carotid, which had been perforated.

Franklin; male 8 years, spontaneous opening of abscess, no operation, recovery; pulsating swelling was evident on the outer side of neck, evidences of general sepsis, later subsidence of external swelling; aphonia not clearing up for several months, long and tedious convalescence; one year later slight weakness of arm and pes equino-varus; probable embolus of middle cerebral artery, a terminal branch of the internal carotid.

Chassaignac; incomplete report; immediate hemorrhage following incision; ligation of common carotid, recovery; probably false aneurism, due to carotid erosion.

Summary of Group 5: Five cases, two fatalities and three recoveries.

GROUP 6.

Hemorrhage in connection with scarlatinal suppuration.

Immermann; male, 17 years, spontaneous opening of abscess, sudden buccal hemorrhage, no operation, death; deep tonsillar abscess found which had perforated carotid, much blood in bronchi.

Pepper; male, 30 years, spontaneous opening, recurrent hemorrhage; ligation common carotid artery, recovery; blood regarded as having come from internal carotid; left vocal cord paralyzed before operation.

Mahomed; in discussing Pepper's paper, reported six cases without particulars, except that some were fatal. From lack of data these cases are not included in this summary.

Lyot and Petit; female, 19 years, elastic swelling suddenly appeared in left mastoid region with systolic bruit; left tonsil pushed toward median line and compressible; puncture externally withdrew blood; spontaneous subsidence; no internal bleeding, recovery.

Summary of Group 6: Three cases, one fatality, two recoveries.

GROUP 7.

Hemorrhages in connection with gangrenous tonsillitis.

Craigin; male, 45 years, spontaneous opening and immediate hemorrhage; no operation, death; right tonsillar space and posterior pharyngeal wall showed partly detached slough, exposing open months after initial tonsillar symptoms; no operation, death from geal.

Terganowan; male, 20 years, spontaneous opening, two or three mouths of two small arteries, possibly twigs of ascending pharyn- hemorrhage; autopsy showed complete destruction of parotid gland and gangrenous softening of entire circumference of external carotid with fistulous opening into throat.

Summary of Group 7: Two cases, both fatal.

Two other cases have been reported under the heading of hemorrhage from circumtonsillar abscess, but they do not seem to the writer to belong to this category.

Wulf; female, 6 years; suspected aneurism of internal carotid; pulsation stopped by compression of the external trunk; ligation of common trunk, with cessation of pulsation and bruit in pharynx; recovery; sac filled up with blood clot, but later suppurated and puncture then gave fluid blood; eventual recovery.

Savory; apparently a case of abscess in the neck involving internal structures, with external hemorrhage; no operation, death.

Excluding the last two cases, we have then fifty-one well authenticated cases of hemorrhage dependent on suppuration in connection with pharyngeal structures. Of this number twenty-three recovered and twenty-eight died, a mortality rate of 54.8 per cent. These figures show the gravity of this complication. Sex is stated in thirty-nine, of which number thirty-five were males and four females. This fact is of no special significance, as circumtonsillar and other pharyngeal abscesses are more common in males. Age is given in thirty-seven cases; seven occurred in the first decade of life, five in the second, eighteen in the third, six in the fourth and one in the fifth. The maximum and minimum ages were 55 years and 5 weeks, respectively.

Operations were performed as follows: ligation of the common carotid sixteen times, with eleven recoveries and five deaths; of the external carotid once with recovery and of the common trunk with both branches once with recovery.

As regards the result of ligation on brain function, no statement is made in eleven of the sixteen cases of ligation of the common trunk; in three cases paralysis followed, and in two it is definitely stated that there were no bad effects. No statement with regard to this point is made in the case of ligation of the external branch nor in the case of ligation of the common trunk and both its branches.

Autopsy records are given in thirteen cases. The bleeding came from the external carotid in two, ascending pharyngeal in one, "carotid" in one, lingual in one, at the bifurcation in one, facial in one; in ten cases in which no autopsy was held the blood was supposed to come from the internal carotid, and from the internal jugular vein in one additional case.

Many interesting questions suggest themselves in connection with this class of cases. We have time to consider but one or two of them.

The first relates to the invasion of arterial structures by suppurative processes. That this does happen is now universally believed, but we must remember that until comparatively recently, it was a mooted point. It was but forty years ago that Bouchard observed that while an artery in a purulent focus did sometimes rupture, he was not prepared to admit that the latter accident was referable to an ulceration in the proper sense of the latter term. In 1873 Cauchois stated that such rupture occurred as the result of the following pathological sequence: 1. Denudation of the artery by the destruction of the cellular wall; 2. Suppurative inflammation of the external tunic; 3. Disassociation and disappearance of the muscular fibres of the middle coat, and 4. Rupture of the external tunic. In 1878 Ehrmann called attention to the patient's general condition as bearing on vascular rupture in pharyngeal suppuration, but did not admit the existence of any diathetic condition as indispensable to the rupture. In 1882 Monod noted that one of the most constant effects of arterial inflammation was the disappearance of the muscular tunic. The muscular and elastic fibers, he says, give place to connective tissue which often unites itself with that of the external tunic and the vegetations of the internal tunic. There results, consequently, a weakening of the vessel wall. Often the external tunic hypertrophies and so supplements the deficiencies of the middle.

Now, all these processes are apt to assume a peculiar virulency in the region under consideration, owing to its proximity to the air passages. The mouth is a hotbed of all sorts of bacterial life, and the parts are constantly flushed with the air of inspiration and expiration. Pus near the air passages rapidly decomposes. The fetid characteristics of mouth abscesses and their virulence are well known. Hence the pus and gas confined in the pharyngomaxillary space cause a rapid death of the arterial wall before any compensating hypertrophy of the latter can be brought about by nature's conservative processes.

Granting the existence of a weakened vascular wall, we have further to recognize the presence in some cases of adjuvant causes of rupture, such as cough and violent muscular effort which momentarily increase the pressure in the vessel. These patients are especially liable to cough from the irritation of the initial blood which trickles down the pharynx, and a slight leakage may become a formidable rent. Another cause, following now the incision of the abscess, is the sudden diminution of pressure on the outside of the vessel wall produced by the accumulation of pus under pressure, which acts as an elastic cushion. The weakened vascular area is thus between the internal force of the blood pressure and the external force of the pus sac. If the latter is suddenly depleted by incision, the unbalancing of pressure is too great for the further resistance of the weakened area, and it gives way. Here arises a point of great significance for the surgeon for the hemorrhage which immediately follows incision is apt to be referred by the patient or his friends to unskillful intervention. Such was the experience in the case reported in this paper. The patient had been having quinsies for over thirty years. They had been opened repeatedly. No hemorrhage had followed. All this long time his habits in regard to consumption of alcohol had been leading up to a condition of distinct arterio-sclerosis. In the last attack the vessel, whichever one it was, had become vulnerable, and when the escape of pus removed the counter-pressure on the vascular wall, it gave way. In a sense, it is true, the surgeon does cause the bleeding, but how much better that it should occur under such conditions than that the destruction of the vessel wall should increase in extent and the rupture of the abscess come on at a time when no relief is at hand, and an immediately fatal hemorrhage may follow. In those cases in which the bleeding has been controlled by various means, we must assume the formation of a thrombus which acts as a plug, and which later becomes organized permanently, stopping the leak.

Even in the case of an aneurism (of which more later) if the opening is not large, it may be closed by a thrombus. At this stage incision is far less dangerous, even if after the emptying of the abscess cavity the thrombus becomes loosened and bleeding recurs. It is possible for the thrombus to involve the contents of the aneurismal sac and become organized. Under these circumstances, spontaneous healing occurs. (case of Lyot and Petit). The chances of such a favorable outcome, however, are lessened if the thrombus is surrounded by pus. The occurrence of a false aneurism depends also on the stability of the abscess wall. If it is friable and ruptures, probably a fatal hemorrhage will occur. The same untoward result may also happen if the abscess has already opened before the arterial wall is perforated.

We have all opened many quinsies and will open many more. We must not forget that some of the most severe and even some of the fatal cases of hemorrhage have come like the thunder-clap out of the clear sky. Patients who have presented only the signs and symptoms of an ordinary quinsy have died from this complication. Naturally, therefore, we are faced with this question; leaving out those cases in which a pharyngeal swelling with pulsation, bruit, etc., indicate the definite course to pursue, are there any signs or symptoms which will warn us that we are confronted with the gravest of dangers? In other words, what quinsies are harmless in this respect and what potentially harmful? The matter of differential diagnosis has received the careful attention of Lebram. We are called on mainly to decide between three conditions, an inflammatory process, a tonsillar tumor with metastases in the cervical glands, and an aneurism. Decision is further complicated by the fact that carotid aneurism sometimes presents distinct evidences of inflammation suggesting a quinsy. Certain aural lesions are accompanied by an extension of suppuration down into the circumtonsillar region. An abscess may form and a pulsation be communicated thereto by some neighboring vessel, though the latter itself is intact. Syphilitic processes with glandular involvement rarely confuse us. The question then reverts to the possible injury of an artery. If an abscess has opened, has blood already appeared, or can clots be turned out of the cavity? Autopsies in such cases have shown that the blood may come from the internal carotid, a branch of the external carotid, the palatine branch of the ascending pharyngeal, the lingual or the inferior palatine branch of the facial. If incision evacuates clot and fluid blood escapes later in greater or less quantity, we must regard it in the highest degree probable that we are dealing with hemorrhage from the carotid which has led to the formation of a false aneurism. Even with unruptured abscess wall inspection, palpation and auscultation would enable us to make a diagnosis if they were uniformly present, but unfortunately they are not as the case of Fehleisen shows. Under such conditions compression of the artery above and below the abscess would make a difference in the latter's physical characistics. It has been found that when inflammation develops over an aneurism pulsation and other usual features may be lacking. Under these circumstances we assume a partial or complete clotting of blood in the sac. The general feel of the parts would not differ from that of an abscess. We would look for a softness and indefinite fluctuation. Some cases of aneurism have presented a tumor-like swelling of the cervical glands.

A point of anatomy mentioned by Chassaignac should be borne in mind. He notes that after middle life the internal carotid at this level describes a curve with its convexity directed inward. (cf. the paper by Connal in the March, 1908, number of the Journal of Laryngology on "Abnormal Pulsating Vessels in the Pharynx.)

Extra-cranial aneurisms of the carotid of traumatic origin are rare. Lebram found only three instances recorded.

Further factors to be taken into account are gout, arterio-sclerosis and lues, also the age of the patient. Growth of an aneurism under these conditions would be slow, and gradual, while aneurism caused by suppurative erosion develops rapidly.

In regard to diagnosis of swellings in this region by the use of the exploring needle we are left in doubt in cases in which the pus is thick or the swelling contains clotted blood. A suspicion of aneurism would, of course, contra-indicate diagnosis by puncture. If a tumor has appeared in the neck a portion might be excised for submission to the microscope.

The brief notes following the cases reported above show that hemorrhage has been checked by or has followed the use of ice,, rest, morphine, packing, etc. Previous to opening a suspicious swelling the artery may be exposed as a provisional measure. Experience would seem to show that in these severe cases the safest plan is to ligate the common carotid. But rarely can we determine the pleeding point. This fact is Clutton's jujstification for advising the ligation of the common carotid, together wth its two terminal branches. It may be asked, why ligate the common trunk and not the external branch? We find the latter sufficient in post-tonsillotomy hemorrhages. but it must be remembered that in the latter emergency quite different local conditions prevail. Pepper states that the ascending pharyngeal which undoubtedly is the source of the bleeding in some of the quinsy cases comes off from the bifurcation of the carotid and ligation of the external branch would not, therefore, help us. The text books on anatomy, however, state that the origin of the artery is not at the bifurcation, but half an inch above. Moreover, ligation of this external branch would lead us into sloughing tissue We are here in a very different environment from that of the non-suppurating tissue of an ordinary tonsillar hemorrhage. Pitts declares that ligation of the common trunk alone is not safe as anastomosis is very common through the branches of the external trunk. Morris expresses considerable doubt as to the possibility of an anastomosing flow through the arteries within the skull, ever reaching down as low as the origin of the internal carotid in the neck. While traumatic hemorrhage in this region generally involves the external carotid or ascending pharyngeal, a large repeated hemorrhage secondary to suppuration is far more likely to involve the internal carotid. Under these circumstances if Morris is right, ligation of both common and external trunks would prevent returnng hemorrhage. The dangers of ligation of the common trunk are not to be under-estimated, but this factor relates to the casuistry of general surgery, and need not be discussed here.

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Since this paper was finished another article on the subject has come under the author's notice, viz., that by Nettebrock (Zur Casuistik der Blutungen nach Tonsillotomie und ihre Behandlung; Inaugural Dissert. Kiel, 1906). This writer reports two cases:

Case 1.. Angina incised in a man of 30 years with slight bleeding which recurred later and was controlled by tampon.

Case 2. Tumor formed in the region of the tonsil, and was incised on the fifth day of throat symptoms on the supposition that it was a quinsy. Fever was lacking, and no pulsation was made out. Incision was followed by escape of blood, but no pus. Bleeding recurred, requiring ligation of common carotid and tracheotomy. This proved sufficient, and the tumor gradually disappeared. Its exact nature was not determined. Some hemiplegia of the tongue followed ligation, but this soon cleared up.

No. 118 West Sixty-ninth street.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, Feb. 26, 1908.

WOLFF FREUDENTHAL, M. D. Chairman.

PRESENTATION OF PATIENTS.

A Case of Osteo-Chondroma of the Septum with Extensive Absorption of the Cribriform Plate, Tumor Extending Into the Cranial Cavity, Sphenoidal and Ethmoidal Cells.

By ROBERT C. MYLES, M. D.

Mr. J. C. had an operation on his nose ten years ago. Three years afterward, his nose began to be obstructed and he consulted a physician, who made a diagnosis of a large bony growth situated very deep in the nose. Mr. C. then consulted another physician, who operated by boring through the nose. This was followed by some relief. In February, 1907, the patient consulted Dr. C., who diagnosed a large bony tumor back of the nose and advised a radical operation. Patient consulted Dr. Myles at the New York Polyclinic, April 27, 1907. Diagnosis was made of a very hard tumor, probably an osteoma, involving the posterior part of the septum and extending into the spheno-ethmoidal region.

A radical external operation was advised, but patient declined, and was not seen again until January 8, 1908, when he consented. Diagnosis was changed to probable osteo-sarcoma, as it had more than doubled in size during the past eight months and because a trocar was driven in it with moderate taps with the hammer.

The operation was performed under cocaine, morphine and hyoscyamin anaesthesia by Dr. John A. Bodine and the writer, January, 18, 1908. After one external carotid artery had been tied, and a temporary ligature placed around the other, an incision was made transversely through the nose close to the inferior borders of the nasal bones, extending through the alae nasi and the quadrangular cartilage down to the level of the face. This allowed the tip of the nose to drop down on the upper lip. The incision was then continued along the line of the articulation of the nasal bone and the nasal process of the superior maxillary as far as the frontal bone, and thence across the nose along the articulation between the nasal bones and the frontal bone. Then the nasal bone was separated from the superior maxillary with a heavy pair of cutting forceps and from the frontal bone with a chisel and mallet. The patient at this juncture protested, manifesting symptoms of some distress and pain. The bridge of the nose was broken loose, laid over the left side and a large tumor was seen filling the greater part of the nasal cavities and accessory sinuses. The macroscopical appearances were those of a sarcoma, especially to our minds, which were already biased in favor of that diagnosis. After Dr. Bodine had removed a part of the tumor, he requested me to remove the deeper parts, which I did, aided by a headlight and instruments especially adapted for intra-nasal procedures. Prolongations of the tumor had extended into the sphenoidal and ethmoidal cells, and the orbital and cranial cavities. Great care was used not to puncture the phagocytic walls and meningeal membranes. A little chloroform was used during the time I was removing the tumor from the cranial cavity. It was noticed that over the area where the cribriform plate was absent there was intracranial pulsation for about one-fourth of an inch.

Microscopical examination of the specimen proved it to be a chondroma. This diagnosis was made by Dr. Jeffries and corroborated by Dr. Jonathan Wright. I present a slide for your examination and a six-ounce bottle filled with only a part of the tumor which was removed. The patient has made an uneventful recovery under the careful attention of my assistant, Dr. Augustus Anderson.

Replying to Dr. Coffin, Dr. Myles showed a piece of the tumor that was removed from the sphenoid cells; the parts that came from within the cranium were long pieces, which had to be scooped out. He did not expect to have any further trouble with the case. The tumor extended through the inner canthi and grew very rapidly. The patient has been under the hands of several physicians, though he did not remain long with any one. The results of the cocaine anaesthesia in this major operation about the nose were very satisfactory. During the tying of the carotids he made no protest, but complained of some discomfort during the latter part of the operation.

Case of Offensive Ozena. By R. C. Myles, M. D.

The patient was a young girl with an almost classical face, yet Dr. Myles said that she had had one of the worst and most offensive cases of atrophic rhinitis he had ever seen. The case developed when she was about 12 years old. If it had developed earlier in life, the form of the bones would not have been so perfect. The case was interesting, as being one of most aggravated ozena with perfect osseous development. The girl was compelled to leave school on account of the disease.

The crusts were examined in many ways, and showed the diphtheria bacillus.

Case of Excision of the Tonsils. By R. C. MYLES, M. D.

Dr. Myles showed a patient with tuberculosis of the tonsil, cured by excision. The man came in about five weeks ago from out west, having been with his sister-in-law who had tuberculosis. He had an ulceration in the upper part of the tonsil extending upward and into the connective tissues of the palate and neck backward. The pain was so great that he was not able to eat. The tonsillar diseased area was excised as completely as possible and at least one-fourth of an inch of the connecting tissue. The cavity was curetted and burned with an electrode. On alternate days 100 per cent. lactic acid and a solution of formalin 1 to 4 per cent were rubbed in thoroughly. There was no evidence of disease of the larynx or lungs, and the most interesting point was the immediate cessation of the pain after the operation. The patient made an uninterrupted recovery, and has had no return of the pain. At a certain stage, irritants seemed to make the condition worse, but under a 50 per cent solution of argyrol the wound healed.

A Consideration of the "Herd" Theory as an Etiological Factor in Ozena. By Clement F. THEISEN, M. D., Albany, N. Y.

(Published in full in this issue of THE LARYNGOSCOPE, *page* 417.)

The Pathology of Atrophic Rhinitis with Ozena. By D. BRADEN KYLE, M. D., Philadelphia.

(Published in full in this issue of THE LARYNGOSCOPE, *page* 423.)

The Treatment of Atrophic Rhinitis, Including Ozena. By ROBT. E. MYLES, M. D., New York.

(Published in full in this issue of THE LARYNGOSCOPE, *page* 425.)

Treatment of Atrophic Rhinitis. By GEORGE L. RICHARDS, M. D., Fall River, Mass.

(Published in full in this issue of THE LARYNGOSCOPE, *page* 429.)

DISCUSSION OF SYMPOSIUM.

Atrophic Rhinitis and Ozena. By CLARENCE RICE, M. D.

(Opening the Discussion.)

(Published in full in this issue of THE LARYNGOSCOPE, *page* 435.)

DR. MYLES, closing, said that in his paper he had referred to the typical atrophic rhinitis, which when one sees and smells, one can never confuse with anything else. This type is rarely unilateral, and the picture is plain. The mucosa and the turbinals seem to be arrested in their development. In these cases he has suspected contagion either by contact or by air. He had seen three or four children, in one family, whose noses were atrophied, and yet the children were rosy and healthy.

This peculiar pus must have something *sui generis*. He did not refer to cases in which there were dry spots, but the cases of general atrophy, and a general degeneration of the mucosa which has a peculiar gray color, and a peculiar tenacious pus. Chemists report that they have nothing that will dissolve it, and it has a tenacious quality of spreading over and adhering to the surface of the mucosa. He thought this had a great deal to do with the arrest of development. He believed that most of the secretions came from the accessory sinuses. In such cases he generally found when cleansing the respective sinuses ten or fifteen drops of a peculiar grayish mucus, which yields under fermentation a peculiar and distinctive odor.

In response to a question from Dr. Kyle as to whether the children to whom he referred all belong to one family, and whether any of their playmates contracted the disease. Dr. Myles replied that he had never examined any of their playmates and did not know about this point.

Stated Meeting, April 2, 1908.

John A. Wyeth, M. D., President of the Academy, in the Chair.

Wolff Freudenthal, M. D. Chairman.

Dr. C. L. Dana, on the part of the Academy, read a tribute of respect to the memory of the late D. B. St. John Roosa.

Symposium: The Diagnostic Value of Symptoms of the Upper Respiratory Tract in General Disease.

a. In Nervous Diseases. By Thomas J. Harris, M. D.

Affections of the nervous system presented symptoms of value and importance from a diagnostic standpoint in the throat and nose, whether they were true organic affections or only functional disorders, such as the so-called neuroses. Of the two, the organic affections were the more important, and showed themselves chiefly in the larynx, and were in the form of either sensory or motor disturbances. The motor manifestations represented either an excess or diminution of action. Excess of action was seen in spasms which might be tonic or clonic. Tonic spasms might take the form of spasms of the larynx or laryngeal crises, or ictus laryngis; clinic spasms might take the form of spasms as twitchings or tremors. When an organic nerve lesion was present it was most frequently one of diminished action or paralysis. These paralyses might involve the superior or inferior laryngeal nerve. A paralysis of the former was rare, while a paralysis of the inferior laryngeal nerve almost without exception involved the crico-arytenoideus posticus at the onset and only at a late stage, if ever, attacked the adductors. This was a striking fact, and its clinical significance was at once apparent. A posticus paralysis had to do with respiration.

After a hasty review of the present day views on the innervation of the larynx, he considered how they might make use of them in a practical manner in diagnosis. This applied chiefly to affections of the medulla and below, although it was true that cerebral hemorrhage, tumors, abscess, gummata and pseudo-bulbar palsy might produce motor changes in the larynx when extensive enough or properly situated. (1) Tabes dorsalis at times showed symptoms in the nose, such as disturbances of the olfactory nerve, resulting in anosmia or parosmia, but usually they were limited to the larynx in some form of paralysis. Unilateral or bilateral posticus paralysis might be regarded as characteristic of tabes. In the bilateral form the one symptom was gradually increasing inspiratory dyspnoea, with expiration unaffected. Even more interesting were the various forms of laryngeal motor irritations in tabes. These included ataxia of the cords, giving rise to the characteristic scanning speech. (2) Laryngeal crises might occur early in the disease, like the palsies, and might even precede the ocular manifestations. The laryngeal crisis was characterized by the simultaneous involvement of all the respiratory muscles, and so differed from an ordinary spasm of the larynx with the cords immobile in the median line and their free borders taut; this would mean in all probability a central nerve lesion. If the picture should change in time to one showing the cords in the so-called cadaveric position, i. e., midway between inspiration and expiration with concave borders, they would know that the entire recurrent nerve had been involved, pointing to the progressive character of the lesion in the bulb. Sensory disturbances in connection with tabes were rare. (3) Multiple sclerosis of the brain and spinal cord would produce symptoms in the larynx almost if not quite as frequently as tabes. The common symptom present was a delay in the muscular action. This might take the form of tremor in phonation, and an abnormal tendency to voice fatigue. There would be noted also the scanning speech, with frequent interruptions by high-pitched explosive sounds. The voice was often raspy or hoarse. Occasionally they met with true paralysis, usually of the adductors. (4) Syringomyelia presented laryngeal symptoms, also motor in nature, and reduced reflex irritability of the posterior pharyngeal wall. (5) Progressive bulbar paralysis was especially characterized by symptoms referable to the tongue, lips and larynx. The laryngeal symptoms did not appear with any such constancy as did the symptoms referable to the tongue. (6) Progressive muscular atrophy very commonly showed symptoms in the larynx or pharynx, and these were usually of the nature of a paralysis, either of the entire throat and larynx, or more often of the larynx. (7) Neuroses, the functional nervous affections, often showed themselves in the upper air passages, and the two most commonly met with were paralysis agitans and hysteria. Paralysis agitans in a considerable number of cases gave rise to laryngeal symptoms, and usually of a motor character. In hysteria nose and throat symptoms were frequently met with, and these might be either sensory or motor. Sensation was often affected. (8) Anaesthesia of the mucous membrane of the nose and pharynx was frequent. The septum was wont to escape, as well as the larynx. (9) Hyperaesthesia and analgesia of the pharynx was quite frequent, and took the form of a choking sensation, tickling, feeling of a foreign body and the familiar globus hystericus. (10) Disturbances of co-ordination during phonation were common. Dysphonia spastica was the term used to describe the spastic form here. After considering a few other conditions which gave symptoms in the upper air passages, Dr. Harris concluded that two things had been shown, viz.: (1) That pharyngo-laryngeal symptoms in nervous diseases were deserving of more attention on the part of the neurologist than they had received up to the present time; (2) that no field offered greater opportunity to the laryngologist for original study and research than that which embraced the innervation of the larynx.

b. In Syphilis and Tuberculosis. By FRANCIS H. BOSWORTH, M.D.

Tuberculosis manifests itself in the upper air passages—in the nose, pharynx and larynx. Tuberculosis of the nose is a clinical and pathological curiosity, and presents no special clinical or diagnostic symptoms of value. The question of tuberculosis in the lower pharynx, the larynx, and the buccal cavity is mainly of interest in that it gives a certain clinical insight into the virulence of the disease, and the diagnosis is confirmed by the pathologist. As a rule, the nearer the tuberculous process involving the upper air tract approaches the external world, the more virulent and hopeless the disease seems to be. Thus, the fatality of laryngeal, pharyngeal and lingual tuberculosis seems to show an increasing gravity in the order given.

When, however, we consider the manifestation of syphilis in the upper air tract, the story is entirely different, and the diagnosis is based upon ocular inspection. When it invades the mucous membrane of the upper air tract, in the majority of cases it pursues a regular and orthodox course, and avoids the eccentricities and idiosyncrasies which characterize its invasion in other portions of the economy. The mucous patch is the result of a deposit of the inflammatory corpuscles in the epithelial layer of the mucous membrane, causing appearances with which all are familiar; occurring five or six weeks after the primary sore, or being delayed often for months, and, in rare instances, characterizing the history of the disease. The second lesion is the superficial ulcer, in which the inflammatory corpuscles are deposited not only in the epithelial layer, but also in the mucosa, probably giving rise to a coagulation necrosis which very rapidly breaks down, the resulting ulcer involving the epithelium and the mucosa of the membrane. This presents the typical and characteristic appearance of the shallow ovoid ulcer, with necrotic tissues, a purulent secretion, and a very limited areola. The third manifestation is the gumma, in which the deposit is not only in the epithelium and mucosa, but in the submucous tissues beneath, such as the periosteum, or whatever tissues may underlie the mucous membrane. This breaks down more or less rapidly as the result of the coagulation necrosis; the narrowing of the blood vessels causes a breaking down into the so-called deep ulcer, or tertiary ulcer, with its ragged, crater-like border, deep-seated, dark-colored areola, profuse discharge of pus, and necrotic tissue. The nasal cavity is the home of the gumma, but, curiously enough, it is rarely observed, owing to the fact that the necrosis and deep ulcers follow so rapidly that they do not come under observation. But three cases are recalled in a somewhat large experience. In the vast majority of cases the first recognition of the disease here is a necrosis of the vomer, or, in rare instances, of the turbinate bones, with the characteristic symptoms of fetid odor filthy green crusts, and the presence of necrosis detected by means of the probe. Necrosis of the nasal bones is almost pathognomonic of syphilis. Many entertain the view that syphilis of the nose or other portions of the air tract is a progressive disease. The writer thinks that this is to be questioned. According to his view it is rather an explosive disease. The poison lurks in the system for months, gathering strength, virulence and activity, without manifesting itself in any form, until finally it suddenly invades one of the tissues of the body, depositing these round corpuscles. Having accomplished this, the outbreak becomes for the time being a local disease, the gumma in the nose breaks down into deep ulcers, which involve the whole mucous membrane, as well as the periosteum, etc., etc.

The larynx is a favorable point for the study of syphilis, but the diagnosis is oftentimes very difficult. The laryngeal symptoms are not easily assigned to the various forms which it assumes—the primary sore, erythema, mucous patch, superficial and deep ulcers. In the majority of the cases we apparently have to do in the larynx with what may be called "laryngitis deformans," an irregular, diffuse thickening of the mucous membrane, as the result of a small ulceration, with cicatricial sequelae, which seriously impairs the function of the larynx, but which presents appearances that are often puzzling. Furthermore, we often have cases in which the main reliance in confirming the diagnosis lies on the amenability to the specific treatment. Very often this fails to aid us.

When we come to the consideration of faucial syphilis—the manifestations in the lower pharynx, faucial pillars, tonsils, palate and uvula, we come to the consideration of the region which is the most favorable of all portions of the economy for the study of syphilis, and where it is readily recognizable. It runs a regular course, manifests no eccentricities, and develops no deceptive appearances.

From a clinical point of view it is a rather curious feature of syphilis that it manifests a marked tendency not to transcend anatomical boundaries. Syphilis of the nose very rarely extends to the skin in front or into the pharynx behind; syphilis of the lower palate very, very rarely extends beyond the border of the soft palate above or the larynx below; while syphilis of the larynx, even more than cancer, shows a disposition to remain a laryngeal outbreak.

In concluding, the writer of the paper laid special emphasis upon three points:

(1) The larynx, beyond all other regions of the body, is a favorable site for the study of syphilitic outbreaks, and the one in which less than other regions they are liable to be mistaken.

(2) The hesitancy of syphilitic outbreaks to transcend anatomical borders.

(3) The fact that an outbreak of syphilis is self-limited and shows no tendency to extend.

In other words, the explosive theory of syphilis is one that is well worthy of consideration.

c. **In Rheumatism, Gout and Diabetes.** By EMIL MAYER, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

DISCUSSION OF PAPERS OF DRS. HARRIS, BOSWORTH AND MAYER.

DR. LAMBERT said that there was no more unsatisfactory condition in medical diagnosis than that of the differentiation between rheumatism and gout. There is no pain in the muscles, or pain in the joints, or pain in the throat—whatever be the cause—that is not called rheumatism, and there is no pain in any part of the body that is not at times tucked into that asylum. Most of the conditions called rheumatism do not belong to that category, and many mistakes are made in the diagnosis of gout and rheumatism. The two are widely different, though both show manifestations in the tonsils and upper air passages. Rheumatism is an acute infection, gout an auto-intoxication from the inhibition or perversion of some function. The reason that we hear of so many cases of rheumatism manifesting themselves in the upper air passages is that most of such cases are really gout. It is very interesting to hear discussions concerning the nasal and tonsillar entrance of rheumatism to the body, and yet in a service at Bellevue Hospital he has been for a number of years seeking for cases of polyarticular joint rheumatism that show a tonsillar infection or give a history of infection in the tonsils. In adults this has not been a common occurrence. There have been cases occasionally in which there was distinct pain in the tonsil, distinct cardiac involvement, and later joint affections. Most of the cases of pharyngitis and tonsillitis with joint inflammation have been cases of gout.

The cases quoted by Dr. Mayer, in which aspirin cured the rheumatism, are of interest, for in his experience aspirin has failed to give relief in rheumatism, but it has cleared up mild attacks of gout and has controlled the pain in severe attacks. It would seem that the reporter of these cases had mistaken gout for rheumatism. In children he thinks there are many more cases than among adults in which the tonsil infection precedes the manifestation. That may be due to the fact that the lymphatic tissues in children are better filters and hold the infection better, simply from the difference in the anatomical structure, as has been shown by Borrel.

Since Dr. Mayer had asked him to discuss this paper, he had taken more than usual care in observing a number of rheumatics, to see if in any there was any visible manifestation in the throat, or if any complaint or evidence of trouble in the throat existed before the true rheumatism came on; and only those in which the large joints were involved were counted. There have been the usual number of different joint infections, and the usual number of cases of gout, but not in a single instance during the last three months in Bellevue has there been any evidence that a rheumatic patient has complained of his throat. We know that germs can pass through the lymphatics of the abdominal cavity and leave no manifestations, and it may be that they can go through the lymphatics of the throat and tonsils and leave no manifestations.

Dr. Leszynsky said that as the larynx receives its innervation from the vagus and accessorius nuclei, particularly through the pneumogastric nerve and its branches, any pathological process in the region of the nucleus ambiguus or in the course of this nerve, will occasion tremor, spasm or paralysis of laryngeal muscles. This is known to occur in various affections of the pons and medulla, in tabes, syringomyelia, disseminated sclerosis, progressive spinal atrophy, etc. Moreover, such laryngeal symptoms also arise in the course of paralysis agitans, convulsive tic, asthenic bulbar palsy, and hysteria. In the so-called polioencephalitis inferior, or bulbar paralysis, in which such symptoms are characteristic and essential, the larynx is never affected alone, without involvement of the lips, tongue, palate or pharynx. It will thus be seen that all degenerative or inflammatory diseases of the cerebro-spinal system are more or less frequently accompanied or complicated by implication of the bulbar nuclei.

The diagnosis of disease of the nervous system cannot be made from the presence of an isolated laryngeal or pharyngeal paralysis. While the latter condition may be highly suggestive, in no sense can it be considered pathognomonic. When laryngeal tremor, spasm or paralysis is the result of such general disease, other indications will invariably be found. As tabes is the commonest type of organic nervous disorder, further remarks will be limited to this affection. A person may have suffered for years from any tabetic laryngeal crises without any of the obtrusive symptoms of tabes—such as inco-ordination, pains, etc.—yet upon eaxmination one may find unmistakable signs of the disease. Such a patient is now under my care. He is a lawyer, 49 years of age. Five years ago he had a severe attack of whooping cough, lasting six weeks. At that time one of the children in the household was also affected. Paroxysms have recurred at intervals of several days or weeks ever since. Probably the pertussis excited the subsequent laryngeal crises. While it is an interesting fact that quite a large number of chronic tabetics have disturbances of the innervation of the laryngeal muscles, in the majority of instances this is of minor importance as compared with other pronounced manifestations. Exceptionally a laryngeal crisis has been known to terminate fatally. Transitory laryngeal paralysis is rare, in contrast with paralysis of the ocular muscles. In the cervical type of tabes, in which arms are first affected, laryngeal crises and posticus paralysis with bulbar symptoms are more likely to arise, the lower extremities becoming involved later in the disease. Let me suggest that loss of the knee-jerks with preserved muscular power in the lower extremities, and loss of the pupillary light reflex with preserved vision, when found combined, may be interpreted as presumptive evidence of tabes or cerebro-spinal syphilis. It should always be borne in mind that in many cases of early tabes there is no ataxia whatever.

Finally, the diagnosis value of symptoms of the upper respiratory tract in the various diseases of the nervous system, depends entirely upon their correlation and association with other symptoms.

Dr. Bulkley said that he was sorry to be obliged to take issue with Dr. Bosworth in regard to the ease of determining the diagnosis of syphilis in the mouth. He has seen many instances where a lesion in the mouth was supposed to be syphilis, but was not; and many lesions which were found to be syphilis where that diagnosis had not been made. It is probable that those who do not see much of dermatological practice hardly realize that there are a half dozen different conditions in the mouth seen in connection with diseases on the skin; for instance, there are eczematous lesions about the mouth and lupus erythematosus is occasionally seen in the mouth. He had seen a great deal of leucoplakia, which was commonly thought to come only from smoking, but is occasionally found in females, though almost invariably in smokers, white patches, etc., which were constantly mistaken for a manifestation of syphilis. He had also seen a great many cases where aphthous sores in the mouth had been regarded as syphilis, and in some of these cases the diagnosis was somewhat difficult. In many of these he has simply used therapeutic tests, avoiding syphilitic treatment, and giving other remedies, and had seen them pass away entirely, evidently being simply innocent non-specific lesions. A certain small amount of lupus in the mouth might be mistaken for syphilis, and finally supposed syphilitic lesions sometimes turn out to be epithelioma.

Coming to the gummata, we constantly find mistakes in this connection. Early epithelioma is often touched with nitrate of silver, on the supposition that it may be syphilitic, and it thus often drifts into a serious lesion. Some cases of epithelioma can with difficulty be distinguished from syphilis.

One thing has not been mentioned this evening about syphilis, viz., the tonsils being the site of primary infection. Syphilis of the tonsil, primary chancre of the tonsil is much more common than most people think. Some ten years ago he had the pleasure of reporting fifteen undoubted cases of tonsillar chancre, and since then he has seen a number of other instances. He had, of course, seen any amount of syphilitic lesions in the throat and mouth, superficial erosions, etc. Chancre about the mouth is also very common. Years ago he had reported the histories of over 50 cases of chancre of the lip, and he has seen thirty or forty cases since then, also many on the tongue. Chancre in the nostril is not extremely uncommon. He had seen several cases, where the primary sore was situated in this locality.

Lesions in the upper air passages, therefore, are a very important element in the diagnosis of syphilis. At the St. Louis clinic, years ago, he saw Fournier present a patient who had palmar syphilis, and also lesions on the tongue; having the patient hold up the palms by the mouth, he exclaimed, "diagnosis conclusive," in view of what had been said the speaker thought this a very dangerous proceeding, as the trouble on the palms might be a chronic eczema, and the lesions in the mouth simply aphthous sores.

It is not well to generalize too much about any of these lesions in the upper air passages.

Dr. Simpson said that as he understood the Symposium to-night, the subject was the diagnostic value of the conditions of the upper air tract in relation to general diseases,—not so much the description of the lesions as we find them. Dr. Bosworth spoke of the importance of biological examinations and the relegation of the clinician to the background, but the time has not yet come when we can absolutely dispense with the clinical side of the question. Some clinical manifestations are as absolute as any of the laboratory findings, and the laboratories are often as dependent upon us as we are upon them.

He was very glad of the point brought out by Dr. Lambert, for it makes a connection between the practitioners in general and the specialists. The speaker has not noted the great clinical relation between acute rheumatism and tonsillitis, although he had made some investigations clinically, as Dr. Lambert has done. At times he has questioned his patients, who had marked tonsillitis and no signs of rheumatism, and in many cases who had acute rheumatism for years, and no signs of tonsillitis. As he inderstood the subject of the evening, the question was how will the lesions of the upper respiratory air tract help in diagnosticating general diseases.

Unilateral paralysis of the vocal cord is one of the earliest symptome we have of aneurysm. He had seen a number of cases where aneurysm had been diagnosed by this one point. It produces pressure, and in a great majority of cases it will be an aneurysmal pressure.

Also a child may come with paralysis of the soft palate, and it will be found that he had a slight history of sore throat, and the case be one of post-diphtheritic paralysis.

Another point is the importance of examining the throat in cases of late syphilis. Tertiary syphilis may show itself in cerebral symptoms, and one can often be enlightened by an examination of the throat and finding evidence of tertiary syphilis there, it being one of the few diseases which leaves a cicatrization in the throat.

Another point of diagnostic value from the neurological standpoint is in the various forms of neuralgias of the face. Unquestionably the interest and the recent investigations in sinus diseases have given us etiological factors in many cases of neuralgia of the face. A case in point was one of supra-orbital neuralgia, which had resisted all treatment. An X-ray photograph was made, and a perfect picture of sinus involvement was obtained. Operation was performed and a large quantity of pus was drained out. The neuralgia was purely of the frontal sinus origin. This was a marked instance of the diagnostic value of a lesion of the upper respiratory tract.

He agreed with Dr. Bulkley that it is very difficult at times to make a clinical differentiation in the various ulcerative conditions of the throat.

Dr. Simpson called the attention of the members to a recently published prize essay by Dr. Frissell of this city, which presented the best exposition of the etiology of rheumatism that he has seen.

Dr. T. J. Harris said that in one form of syphilis of the nose he had seen three or four patients who complained of all the symptoms usually associated with hay-fever—sneezing, obstruction and watery discharge. They gave no history of syphilis; but suggested that they were cases of such neurosis as asthma. He had even thought that it was ethmoiditis; but they were speedily cured by antispecific treatment. Possibly the explosive attack was in that part of the nose; but the condition was such that it was entirely relieved by anti-specific treatment.

Dr. Bulkley said that he could easily understand how a small gumma might produce symptoms of asthma, and how the ethmoid might be affected. Such cases would bear out his contention. We are justified in such cases in administering anti-specifics for the purpose of making a diagnosis.

Dr. Emil Mayer said that the discussion was well worth while if it showed what differences of opinion there still exists as to what constitutes gout and what rheumatism.

For his own part he felt that he must accept the diagnosis of so large a number of observers as he had found in the voluminous literature, and of which he had presented a very small part from the most recent writings.

The main point at issue was whether the infection enters by way of the mouth, and if so, does it find entrance through the tonsil in the majority of instances?

For this he had presented rather fully the statements pro and con, and while the majority is not necessarily always right, its opinion seemed to the speaker justified, namely, that it should be answered in the affirmative.

To show this the speaker mentioned the case of a young man whom he had seen after an attack of syncope, and found him with an endocarditis. He had a history of a follicular tonsillitis a few weeks previous and before that he had never been ill, a fact the speaker knew well, for he had treated him since his birth. One other case was a woman 40 years of age, with endocarditis. She had a tonsillitis, and cultures showed streptococci and staphylococci, the former predominating, four days later she had a typical endocarditis.

Dr. Simpson called the attention of the members to a recently published prize essay by Dr. Frissell of this city which presented the best exposition of the etiology of rheumatism that he has seen.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, April 14, 1908, A.

A. H. ANDREWS, M. D., PRESIDENT.

PRESENTATION OF CASES.

Xanthoma. By JOHN EDWIN RHODES, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE..

Tuberculous Laryngitis. By GEO. E. SHAMAUGH, M. D.

Dr. Shambaugh exhibited a case of tubercular laryngitis in a man 50 years of age. Symptoms of hoarseness began about a year ago, and at no time until within a few weeks has he suffered from any other symptoms. Recently there has been some slight pain on swallowing. No evidences of tuberculosis were found in any other part of the body. The condition was one involving only the right side of the larynx. There was extensive nodular infiltration with ulcerations occupying the false cord and extending to the arytenoid cartilage. There was very little reaction about the lesion such as oedema and redness. The vocal cord is freely movable and is apparently not involved. The microscopic sections made from tissue removed from his throat were exhibited, showing typical tuberculous infiltration with numerous giant cells.

Chronic Suppurative Otitis Media, with Thrombosis of Lateral Sinus and Jugular Bulb, Erosion of Facial Canal and Cerebellar Abscess. Operation and Recovery. By NORVAL H. PIERCE, M. D.

DISCUSSION.

DR. JOS. C. BECK: There were two points of interest in this case; first, the presence of cerebellar abscess without symptoms; second, the chill. In a case recently under my care I made a diagnosis of labyrinthine disease from symptoms such as nystagmus, staggering gait, etc. On exposing the labyrinth, I found it unaffected, but there was a perisinusoidal affection and compression of the cerebellum, which was producing these symptoms. When I cleared up this condition, the symptoms disappeared. Therefore, may not the nystagmus in Dr. Pierce's case have been one of the symptoms of cerebellar abscess?

As to the second point, the chill, I have learned by experience, when this chill has occurred, to suspect sinus trouble and I expose the sinus at once. I have operated recently on such cases with gas-oxygen anesthesia to my absolute satisfaction. There is no danger of collapse and prostration. I would like to ask Dr. Pierce whether the facial paralysis cleared up.

Dr. Frank Alport: Would not the fact that there was evidently labyrinthine involvement in this case tend to lead one to suspect as soon as such labyrinthine involvement became manifest, that there was also a purulent infection of the brain which, indeed, proved ultimately to be the case. It should not be forgotten that the labyrinth is one of the principal avenues by which infection reaches the brain cavity.

In all cases of mastoid or brain infection I invariably insist upon frequent blood examinations, both microscopical and bacteriological. For instance, the finding of streptococci in the blood would be a strong argument in favor of a septic intracranial complication. Careful and frequent blood counts are also useful, especially after the mastoid has been opened and we know there is no retained pus in this cavity. Under such conditions a high percentage of polymorphonuclear cells would certainly lead one to suspect intracranial involvement. I do not regard the blood count as infallible, but I nevertheless have much respect for its findings.

I agree with Dr. Pierce in the deductions he has drawn in this case; that is, I think it would have been better if he had at his initial operation broken through the bony covering of the sinus and ascertained the conditions within. It certainly would have saved much suffering, danger and time in this case, and would have only taken a very few more minutes of operative time. I am firmly convinced that in all doubtful cases the sinus and the dural covering of the middle lobe of the brain should be fully exposed, and believe this to be the usual practice amongst aural surgeons. A positive diagnosis in many of these cases is extremely difficult and we need all the evidence and side-lights we can obtain in order to perform our duty to our patrons.

Dr. Geo. E. Shambaugh called attention to the fact that the nystagmus and ataxia which occurs in cases of cerebellar abscess are not unlike the same symptoms arising from a pus infection in the labyrinth. The cerebellar abscess of otic origin arises usually from an extension through an involved lateral sinus, or by way of the labyrinth. If the cerebellar abscess follows secondarily upon suppuration of the internal ear, one may be able to diagnose the occurrence of a cerebellar abscess by finding a complete destruction of hearing and an absence of increase in nystagmus and vertigo by the Barney method of syringing the external canal with hot and cold water.

Dr. Pierce, closing the discussion: The nystagmus can be accounted for by the findings in the labyrinth. It was labyrinthine nystagmus because the condition disappeared after operation on the labyrinth before the cerebellar abscess was opened. The facial paralysis has disappeared almost completely. There is very little lack of movement on that side of the face.

A blood count was made a number of times, but I place less and less dependance on it as I go on with this work. In positive cases we do not have to make it, and in the doubtful cases it is too uncertain and not always of value.

This was undoubtedly a case of sepsis, but the question was,—where was the pus being poured into the venous channels. On account of the condition of the patient and the fact that the sinus appeared to be normal, I deemed it best to delay opening it.

Salivary Calculus. By Henry Gradle, M. D.

Dr. Gradle showed a salivary calculus about the size of a large pea. The patient had had attacks of painful swelling of the submaxillary gland lasting weeks at a time. Even between the attacks the gland was enlarged and somewhat tender. A concretion could be felt in the duct underneath the tongue. It was scooped out after an incision under cocain injection. Uneventful healing. Gradual return of the salivary gland to its normal condition in about a month.

The Simulation of Mastoid Disease by Furuncle of the External Meatus and Peri-Auricular Abscess. By Henry Gradle, M.D.

To be published in full in a subsequent issue of The Laryngoscope.

DISCUSSION.

Dr. J. Holinger: Although the differential diagnosis between mastoid abscess and periauricular abscess is exceedingly difficult, it can be made. I often give this question in competitive examinations, and while the answer appears to be an easy one, it is not. In three cases of swelling of the parotid gland the diagnosis was extremely difficult; in another case a mastoid operation became necessary because the mastoid was involved later on. The parotid was incised for pus. The temperature increased from 101° to 103° F. The inflammation of the gland and mastoid was influenced favorably by interdicting the administration of fruit juice.

Dr. Norval H. Pierce: The differential diagnosis between the swelling back of the ear caused by furunculosis of the external auditory canal and swelling behind the ear from mastoid disease, is very simple. In the former, there is *edema* of the soft parts back of the ear, and in the latter, there is *infiltration.* In the one case (edema) the swelling pits on pressure and in the other (infiltration) it does not. In infants there may rarely be some edema in mastoid disease, but it almost never occurs in adults and is not so marked. A case happened in my experience where a consultant in a large city was called to a small country town to operate for mastoid abscess. The patient was a young adult complaining of pain in and about the ear, fever, and with marked swelling behind the ear; the auricle was displaced downward, outward and forward, and the external auditory canal was so filled up that a view of the tympanic membrane could not be had; but on the mere fact that it was edema and not infiltration back of the ear, the diagnosis was correctly made.

DR. O. T. FREER: An old gentleman had repeated swelling of the parotid, non-septic in character, occurring about once a week, and looking like a case of mumps. I knew that he had a recurrent parotitis, but could not discover the cause. A prominent surgeon said that there was dead bone in the jaw, which he wanted to remove, but the patient objected. He came back to me and consented to an opening of the duct of the gland. I took out a fish bone, and the patient promptly recovered.

DR. FRANK ALLPORT: I agree with Dr. Pierce as to the diagnostic significance of edema and infiltration, but I have seen edema present in both cases. As a rule, the diagnosis of furunculosis is an easy one, and yet I can readily understand how one can be misled. I have had cases where I had to hold the diagnosis in abeyance, especially when it is not a simple case of furunculosis; where the starting point is a middle ear involvement, with more or less chronic discharge, followed by infection of the canal producing furuncles.

DR. J. C. BECK: I want to call attention to a positive diagnostic point, and that is the skiagraph. In furunculosis the mastoid is clear, except when there is also mastoid involvement, as in *Case* 3. The skiagraph shows not only the involvement of the mastoid, but the degree of involvement.

DR. A. H. ANDREWS: I find the transilluminator very useful in doubtful cases.

DR. GRADLE, closing the discussion: Dr. Pierce's differential diagnosis applies to many cases, but what I wished to point out is that there are exceptional cases that are very puzzling for the time being, especially when there is no swelling with existing pain and tenderness. In the third case, I certainly would have preferred to operate, but, unfortunately, the patient must be consulted.

Case of Headache Caused by Non-Suppurative Frontal Sinuitis.

By FRANK BRAWLEY, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

Chondroma and Osteoma in Faucial Tonsils. By LORENZO N. GROSVENOR, M. D.

Microscopical examination of a pair of tonsils removed from a lady of 27 years. In one was found a circle of cartilage with many areas of ossification; in the other tonsil was a triangle of cartilage and bone.

One group of writers found the tip of styloid process protruded into the tonsils. Another group claimed the condition was due to metaplastic changes. Still another group considered that the cartilage and bone originated in abnormal development of cartilaginous rests of the second bronchial arch.

In study of my case, I draw the following conclusions:

1st. The cartilage and bone is not part of the styloid, for we cannot palpate the stump of the styloid process between inferior maxilla and the vertebral column. Here, too, there is not a single nodule of cartilage or bone, but a ring or triangle.

2d. The condition is not one of metaplastic changes, for there was no clinical history or pathological findings that would cause such changes.

3d. The logical conclusion, therefore, must be that the cartilage and bone found in these tonsils was developed from a matrix of unused or displaced embryonic cells derived from the second bronchial arch. A. A.

Lantern slides were exhibited by Dr. Grosvenor, Dr. J. Holinger, G. W. Boot, O. T. Freer, L. W. Ostrom and Geo. E. Shambaugh.

DISCUSSION ON DR. BRAWLEY'S PAPER.

DR. O. J. STEIN: I believe that Dr. Brawley cured his patient by the work done on the naso-frontal duct, and not by the excision of the middle turbinal, which, he says, is the usual method.

DR. BRAWLEY: This is the one exception.

DR. N. H. PIERCE: Did I understand you to say that you cauterized the naso-frontal duct with trichloracetic acid?

DR. BRAWLEY: Yes.

DR. PIERCE: Would not that cause stenosis?

DR. BRAWLEY: Not if it is followed by frequent and persistent probing.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

Twenty-ninth Annual Congress. Washington, D.C., May 7 to 9, 1907.

A. W. DeRoaldes, M. D., President.

(*Continued from the May Number, page* 416.)

Large Tumor of the Laryngo-Pharynx Removed by Subhyoid Pharyngotomy.

Age of patient 51 years, developed a cough at 18 which persisted. At 36, became hoarse after grippe; at 45 breathing became slightly labored, and in a short time she had attacks at night when there seemed some danger of her suffocating.

Two years ago she started to choke when eating. A laryngoscopic examination revealed a large mass completely filling the laryngo-pharynx. The large size of the tumor and some adhesions made removal through the mouth impossible. The patient was taken in the Manhattan Eye, Ear and Throat Hospital, and a preliminary tracheotomy performed. About three weeks later I performed sub-hyoid pharyngotomy and removed a large fibroid tumor. The recovery was complete. A. A.

The Problem of Asepsis in Routine Office Work. By Thomas Hubbard, M. D.

(*Published in full in* The Laryngoscope, *July,* 1907, *page* 519.)

DISCUSSION.

Dr. King: I have an instrument that I should like to show in connection with this device for the sterilization of sprays in office-practice. It causes annoyance and difficulty, and often delay; to keep the spray-tips thoroughly sterilized. This little sterilizer is attached to the back part of the cabinet. On the back part is a rack for the sprays. There is a stand arranged to fit on the back of the cabinet, with the gas-jet underneath for the heating.

I use the same kind of sprays that Dr. Hubbard showed with his instrument. When they are setting in the rack, the ends of the spray project into the sterilizer. Being just above the level of the water, they are being steamed all the time. The amount of gas used is insignificant, and does not vitiate the air. You keep a guard underneath to protect the bottles; and take it off, if you want the spray heated to a warm temperature. The bottles are liable to crack, if the heat is great on one side.

The slot in the sterilizer corresponds to the height of the ends of the sprays; so, when thrown into the rack, there is no difficulty in fitting them in easily. It is devised so as to hold eight or nine sprays in the ordinary cabinet-rack. They not only keep thoroughly sterilized, but the water is constantly boiling at a very high temperature; although I have no scientific measure of the temperature, and of the amount of sterilization resulting. When used not more than once or twice an hour, they are being sterilized all the time.

The sterilization by means of steam has a double advantage: if you put the point of the sprays into the boiling solution, they are likely to take up some of the water; and this gets into the spraying-solution, either by capillary attraction or by syphon-action, the spray soon becoming half filled with water. Sterilizing with steam also keeps the sprays pretty well cleaned out. They are always dripping with condensed steam, and are thoroughly washed of mucus; so they do not become stopped up, as in the dry method. If the mucus dries in the lumen of the spray, you have to run wire through it.

This device serves the purpose admirably in office-practice. It is made by a local instrument-maker, and consists of an ordinary sterilizer with a slot cut in it.

I was very much interested in Dr. Hubbard's paper, especially in regard to the sterilization of the instruments and of the air. I have not been quite so particular as he has been, but I think it is a very good idea. In conversation with him, he told me that in the filtration of air there are so many impurities taken up by the filters that he puts on over the ends of the sprays, that we must often project a good many of these germs into the fields of operation—especially wound-surfaces. We have adopted the method of using these little tongue-napkins. I believe Dr. Hubbard uses the paper-napkins instead. The dental napkins, four or five inches square, are, however, very convenient. They cost less than half a cent apiece, and are practically always sterile; though you can sterilize them, if you desire to do so.

Dr. Arthur A. Bliss: We are all very much indebted to Dr. Hubbard for presenting this paper. He has given me many new ideas as to office asepsis. I have not been so careful as he is; and I think it is surprising how little infection any of us have had in our work, yet I do not think many of us have carried the details of office-housekeeping to such an extent as Dr. Hubbard has related; but that is no excuse for not doing so. All these details are of importance, especially the practical method of obtaining cleanliness in our office-work.

Dr. W. F. Chappell: We are certainly all indebted to Dr. Hubbard for taking such great care of the patients. I had hoped that he would also suggest some method by which the doctor could be taken care of. I had an unpleasant experience of that sort this winter:

I am sure that all of us, in using the sprays and the syringes for the nose and throat, find that the patients often cough something on to the doctor. I had this forcibly brought home to me this winter. An old case of peritonsillar abscess was sent to me, and I found a large tumor down in the inside of the pharynx, which, after examining, I found to be an abscess. On opening this, we had the bowl ready for her to expectorate into; but the pus, running out quickly, frightened her; and she jumped up, and expectorated the contents into my eyes. I immediately washed them out, and took the ordinary precautions; and, always having been very well and strong, I thought that no germs could get into me. Five days afterwards, half an hour after having felt perfectly well, I had a severe chill. I went to bed; and during the night, my eyes and face began to swell. I had a septic dermatitis, extending from my eyes and ears down to my neck, and lasting five days.

After this experience, I certainly felt that hereafter I should very well remember the danger to the doctor in our office work. I think that there should be some way by which we could be protected. It is very rarely that a laryngologist goes through his lifetime without something of this kind happening to him. For use in such cases, I think there should be something with which to protect ourselves.

Dr. Richards: Ordinary automobile goggles, made of gauze, and sufficient to cover the face, could be designed for this purpose. This arrangement would be cheap and it could be sterilized. The doctor could wear it whenever infection was thought possible.

Dr. Myles: A subject like this is very broad and wide; and, of course, Dr. Hubbard's known genius for practical things makes him a very good leader. I dare say that each one of us will improve in our method of protecting ourselves and our patients by using the newly suggested devices as soon as possible. A little experience-meeting of this kind will give us what we are looking for most quickly.

In operating, I am frequently covered with blood from the top of my head to the soles of my feet. There is a peculiar kind of oiled-silk gauze that I use to cover the patient and myself. It is very thin, and gives quite good protection from the fluids.

I also have on hand half a dozen panes of glass, and a nurse holds one of them in front of my face while operating. In these coughing, gagging cases, when extensive dissections are made around the throat, and even in laryngeal operations, these are of use. I often need three or four before an operation is finished. They are simple, cheap, and easily washed and sterilized. There are glass shields that drop down from the ceiling, but these cannot be quickly changed. The simple pane of glass solves the problem better than anything else.

Regarding asepsis in the office, we are just on pioneer ground. I have my instruments boiled, the same one, perhaps, a dozen times a day. It is an annoyance, but I do it on general principles. Our regular office-attendants are not quite accustomed to this work, and are not so careful as they should be.

It is true that we have no definite knowledge of the occurrence of much sepsis in office-practice, but it is possible that there are some forms of septic conditions that are not localized in their manifestations. Sometimes, after operations, the patients do not do so well as we should like in a general sense; and this may be the result of contamination. If someone would take up the subject and give us his conclusions as to a practical and economical way of securing asepsis, I think it would be a great advantage to the profession at large. It can be done with the proper paraphernalia; but the expense would be so great that the fees would have to be too large for the patients to stand. The idea is to bring it within the pale of reason.

The asbestos-packed syringe is the only one I find that can be properly treated. We often do inject into the accessory sinus cavities material that will be a source of danger. This happens particularly in the early part of operations in which we curette these sinuses. For this reason, I have tried to avoid many applications on these wounds. I should rather trust them to nature than to our ideas of cleanliness. There are too many sources of infection encountered in the process. A man takes his finger and puts the cotton on a swab, and then runs it up to the fresh wound. It comes in contact with his fingers and the patient's nose, both more or less septic. I have seen much better results follow my present way of dealing with such cases than have followed the previous indiscreet use of many applications.

Dr. Makuen: I should like to ask Dr. Hubbard whether he has had any experience with the metal-piston syringe.

Dr. Hubbard, closing: No; but my colleagues have. They are very satisfactory, but they need a great deal of attention to keep them clean and in working order. You cannot leave a corrosive solution in them without ruining them completely. The asbestos-packed syringe is the best. Those packed loosely are much better for delicate work—one that is as long as possible, and works with as little friction as possible. That packed by Ermold is the best for ordinary purposes.

Dr. Chappell's inquiry has been answered by Dr. Myles better than I could have answered it. When there is a reasonable chance of doing an aseptic operation, I think we should go to the extreme care of wearing rubber gloves or sterilizing our hands thoroughly before attempting it. Dr. Myles has hinted at this; and I find that Dr. King wears rubber gloves, as a rule—partly for his own protection. I thank you for the discussion of my paper.

A Review of the Methods in Use for the Removal of Adenoids, with a Description of a Method which is Thorough, Rapid and Safe. By George L. Richards, M. D.

(*Published in full in* The Laryngoscope, *September*, 1907, *page* 669.)

DISCUSSION.

Dr. Makuen: About eighteen years ago, when I was a pupil of Dr. Cohen's, I started to write a paper on the removal of adenoids; and he said then that there was nothing especially new to say upon the subject, but even now it seems to possess great possibilities for discussion; and as the time is short, the Chair would request you to be as brief as possible. This does not apply to the first speaker, who, at the desire of Dr. Richards, will be Dr. Farlow.

Dr. Farlow: This subject has interested me for some time. In 1897, I showed in this very room, the instruments used in removing adenoids. It almost seems to me that, in order to cut off anything well, there should be a fixed point, or fulcrum; for you can do it better with something that holds and then cuts, than with an instrument that just cuts. The Gottstein curette simply cuts off, and the part of it farthest from the stock seems to deviate. The use of something like the guillotine, which holds and then cuts, is an ideal method. The disadvantage of the guillotine is in cases in which we cannot see into the pharynx so as to know how large an instrument should be used; whether the growth has spread about; and whether it will fit that particular instrument. For that reason, it has always seemed to me, in contradistinction to what Dr. Richards has said, that it is adapted to growths that we can see, and not so well adapted to use in the cases of young children. In young children, the operation is done under complete anesthesia, in which case we can pass our finger in and tell where the growth is. There are very few as good as this for use when the patient is under local anesthesia. We can form an estimate of the size of the instrument; we can remove it with very little bleeding; and the discomfort is reduced to a minimum. It seems to me that this instrument has such a field of its own that there is no comparison with other forms of operating.

I have operated on some of the members of my own family, and have tried upon them different methods; and they have told me that this is as little painful as any, because the operation is done so quickly. One of these operations was done in such a smooth manner the patient did not spit out the piece afterward. It was done at a clinic; and a number of doctors, who had come to see me operate said: "You did not succeed, for you did not seem to get anything out." I looked into the throat and saw the growth in place, and I thought that my instrument must have slipped; but I passed a probe through the nose and dislodged the growth, and it came out all in one piece. The patient was not conscious that I had cut anything, and those present had seen no blood. What little blood there was had probably cemented the piece there, but there was very little bleeding after she had spit it out.

The use of the guillotine, seems to me an ideal method in proper cases, but I do not quite agree with Dr. Richards that it supplants other instruments for use in children under anesthesia. In other cases, however, it seems to me away ahead of them. The forms that have sometimes been made give the light from up above down, and do not fit in well; but some of these modifications are well adapted to the cases. It is very important to either feel with the finger or look in with the mirror, and see what the problem is.

DR. DELAVAN: As regards the sales, I think Dr. Richards has given a false impression. I have followed them for a number of years. I had nothing to do with the sales; my commission has, indeed, been unusually small; I only know that in talking to the instrument-seller, he would tell me that he had sold a great many of them.

Dr. Richards: The instrument-sellers told me that they had sold very few.

Dr. Delavan: My experience with the Schuetze instrument was not fortunate. I sent abroad for one about ten years ago, and attempted to use it on a child under complete anesthesia. The blade broke, the side-bar, which connected the blade with the main body of the instrument, having given way at its attachment; so I then had an inch of side-bar with the blade, constituting a slender object of steel with two arms at right angles to each other, which had become entangled in the adenoid at its thickest part, resisting the removal of the instrument. I found it very difficult to disentangle this foreign body. Had I been operating without complete anesthesia, I should have been in an awkward predicament. Fortunately, the foreign body finally came away.

One thing that renders this instrument objectionable is that the pharynx must fit the instrument. It is desirable that our instrument should adapt itself to the conformation of the pharynx. I do not believe that three sizes are enough to meet the indications for the different ages and sizes of the patients.

Regarding the Gottstein knife, we have other makers of knives much better. There is scarcely a good sample in Dr. Richards' whole outfit. The best modification of the Gottstein knife that I have been able to find is that made by Dr. Richard Frothingham, of New York. I have a set containing six different sizes. It is adapted to the conformation of the pharynx; it is perfectly shaped; and is far superior in every way to any of those passed around. I think it a great pity that this particular instrument has not been better recognized by the profession, for I feel sure that it would prove acceptable.

Regarding the palate retractor, our friend, Dr. Hooper, who was the man to introduce the method of operating under anesthesia in this country, uses a retractor of hard rubber, which is better in every respect than any metalic retractor ever made. If you have not tried it, I recommend it to you.

The subject of clearing out the fossa of Rosenmueller, I thought, had been exhausted long ago. Adhesions in this neighborhood and adenoid elements have a marked effect upon the Eustachian tube and the middle ear. The older otologists under whom I studied advocated this very strenuously, and have sent to me patients whose adenoids had been removed, leaving a fragment in the fossa of Rosenmueller; and whose ear-symptoms had not subsided. The removal of this fragment was followed by distinct relief.

Dr. W. K. Simpson, New York City: I use Dr. Frothingham's curettes. They are by far the best shape of curette that I know of. He has modified them so that they fit admirably the various conditions in the nasopharynx. This is sometimes a matter of personal experience; but I think that, coming down to the forceps, which I prefer to the curette, the model made by Dr. Concannon are the best. It has a guard, so that one can do absolutely no damage with it. It also has the advantage of invariably taking out all the adenoid in toto. This permits one to show the growth to the parents of the child, which frequently cannot be done when the curette has been used.

Dr. Coffin: I think we are indebted to Dr. Richards for bringing this subject to our attention, for it makes us all think. His crows were all pretty black, and the rest are a little lame and limp. The success of an instrument largely depends upon "the man behind the gun" and his experience. Dr. Richards has shown some models that are very poor—instruments that he has discarded because of their liability to wound the Eustachian tube; but with his own instrument he can cut it right off, and it does no harm. The fact is that we all have our own particular methods and instruments, with which we can work best. Some of the instruments that Dr. Richards has condemned are poor models of good instruments put on the market by the designer. We all know that a man designs an instrument and takes great pains to see that it is properly made; but when it comes to be made by some other instrument-maker, its designer would not recognize it.

Dr. Swain: In response to Dr. Farlow's suggestion, I bought a Schuetze guillotine. I liked it, for it did good work. It has lessened my general anesthesias by one-half, if not three-fourths. In quite young children, I have been able to get out a large mass readily with my finger.

Dr. Richards has done what I have delayed doing myself, and rigged a guillotine shorter in the shank. The limitations of the instrument are—and I have used it long enough to speak with authority—that when you have a central mass on two sides, you are liable to miss the side-strings from the main mass; and that you often miss the part of the growth on the posterior wall, where the axis articulates together. There is no single instrument that has not its limitations, nor any in which the man that is accustomed to it cannot do better work with it than with an instrument that he does not understand so well. If you follow up the Schutze guillotine with a blade-currette, you can do the operation very nicely. It is not perfect, but it is a method worth considering.

Dr. Casselberry: I have been so unfortunate as not to have heard Dr. Richards's paper, but I have a word or two to say. I think I had made for me the first adenotome made in this country. The instrument was sold for quite a number of years by a Chicago house, but I never thought much of it, or used it very largely. The next instrument of this kind that came along was the Schuetze, and I did not think much more of it. It was narrow in its loop and obtuse in its curve, and was also too long in its shank. The next put on the market was the Gradle. In our part of the country this at once attracted attention as an instrument that would do, in my hands and those of my confrères, what neither my adenotome nor that of Schuetze could do; yet the Gradle instrument also has its limitations. I will not repeat those that Dr. Swain has mentioned, but I should like to add my voice in their favor. There is another limitation, which he has not mentioned, which has been the most difficult to correct. The Richards instrument may correct this defect. I do not know; for I have not used it and have not seen it. After the use of the adenotome I find, on examining afterward, that when I have removed what looked like a very satisfactory oval, correctly contoured adenoid in its entirety, and when I have also got the lateral parts—I have left a couple of pieces behind the posterior nasal openings, and have to make a supplemental operation of some sort, to get the openings as large as they should be. That is a necessary limitation of every adenotome that I have seen.

Dr. Richards: I have referred to that and shown how to obviate it.

Dr, Casselberry (continuing): Of course, the adenotome will do in connection with curettes. I am now using one that I have devised, but have not yet published. I have spent much labor on it, and would call it a modification of the Gradle, because it conforms to the acuteness of the Gradle curve. It does away with the cumbersome handle; and another great advantage that I find in it is for use in adults and adolescents—those that can sit in a chair and have the operation done, in whom you can do what you have to do with a single stroke, and in whom you can make the operation fairly satisfactory without serious discomfort to the patient. I use it often, but do not consider it or any other adenotome an instrument of universal applicability.

Dr. Leland: I make a complete clearing-out of the fossa of Rosenmueller. You have to get the adenoids out of that, or there will be recurrent earache. When the adenoids are removed by a throat man there is often recurrent earache. Why is this? It is because the fossa of Rosenmueller is still filled, owing to the fact that we use the Gradle forceps larger than is necessary. We do not consider the bulging forward of the spinal column. When we use a small instrument we can get the first curve down straight and bring it down to the side of the mouth, where you wish to get it. You can then get the fossa of Rosenmueller cleaner. When you go in straight, you know where you are going—when you curve around you may cut off the Eustachian tube. The smaller Gradle sometimes used is the one to use, rather than a larger one that will fit the cases.

I want to speak of something that happened at the Pittsburg meeting, in 1893 or 1894: Dr. Roe was told by the President that anyone showing instruments before the Association must present them to him. I suppose this will not be enforced to-day.

Dr. Swain: I want to testify that this law is still in existence, them to him. I suppose this will not be enforced to-day.

Dr. Myles: Dr. Richards's demonstration is timely. I have no doubt that, for a certain line of cases, this is an ideal instrument; but, as we are teachers to the general profession, as well as aiders to ourselves, I think that there are two ways of looking at it.

We ought to go on certain principles. If an adenoid is to be removed, should this be done by introducing an instrument into a blind cavity, without intelligence as to what the instrument is doing? Or should we direct the forefinger in there, and let it tell us? I am opposed to having anyone that has not thoroughly educated the tip of his finger introduce any cutting instrument without also introducing his finger.

On the other hand, this instrument is practically protective, providing the center axis of the instrument is kept in a line with the center of the head. I have tried this, and have shown how easy it is to remove unnecessary parts when this is not done. If kept in the center line, it can do no harm. This is a great advantage to the man who has the elbow education, so to speak. One can tell when one has the Eustachian tube or any other part by the education of the arm, but I should not trust to this altogether. When using the forceps the average man should have his finger in at the same time. I do not see how anyone can attempt to remove tissue from the Eustachian tube without having his finger in.

About eight or ten years ago I presented before a society some specimens of synechiae of the vaginal process. I wonder whether they grew there normally, or were the results of adhesions. I have a good many specimens showing complete synechiae. There seems to be a union between the adenoid and certain things in the tube. It would appear to me that if we clear out the Rosenmueller fossa to the right depth we might prevent these adhesions. If we put two raw surfaces together we are almost certain to have adhesions. I have never removed the adhesions entirely, but have broken them loose in the deeper part. A great many cases have no adhesions at all.

This little part that the doctor has so well drawn, I have always had to put my finger in the nares and hold it there, until I cut it with the forceps. One little trick that helps us is that if the instrument is pushed to the back part of the septum, until it is driven firmly into the septum, you can get all out; but if the engagement is bad, you will have a chunk left to be removed later with the snare through the nose, or by means of the forceps.

I have used the Schuetze adenotome a number of times; but I finally gave it up, as I found that it had no special effect, except being a good instrument to use with young adults. When a little child is under an anesthetic, a specialist locates the adenoid and then slips in the instrument.

Dr. Makuen: I regret that among all these beautiful instruments that are to be donated to the Association—

Dr. Richards: I cannot donate them. I do not own them.

Dr. Makuen: I fail to find a modification of the Gottstein curette that was made for me fifteen or eighteen years ago. It was made with the thought in mind that Dr. Myles has just advanced. There are two modifications: one, this little moon-shaped excavation behind the blade, to enable the operator to get behind the growth; and the other, the little notch in the tip of the handle, which enables the operator to hold the instrument in the correct position, firmly against the posterior wall of the pharynx, so that it may be brought down firmly through the growth without wabbling around in the hand, as it does when it is held as is a pen. If you get it firmly fixed in the fourchette of the hand, you can bring the adenoids out as perfectly and as whole as you can do it with any other instrument.

Dr. Richards (closing): I do not wish to be misunderstood. I do pay attention to the fossa of Rosenmueller. I have shown the curette and the original Hooper retractor. I merely mean that the present teaching is that everything must come out, so that a good many have torn out everything; and the adhesions that appear afterward are just as troublesome as those that have occurred before. In a great many cases in children the amount of adenoid tissue in the fossa of Rosenmueller is so small and pulpy that it can be removed with the finger.

With reference to Dr. Casselberry's remarks, I would say that I always carry something else with the instrument. If anything is left, you can use the curette. Before using this type of instrument at all, the finger should explore the growth. You can push the thing back and pick it up, so that it all engages in the fenestrum of the instrument.

I did not suppose that anyone would agree with me, but it is a good thing to take up these old subjects. I admit that the models are bad, but they are sold to someone, and the students are buying them. They are described in the text books, and they are going into some child's nasopharynx.

Straightening the Nasal Septum. By Arthur W. Watson, M.D.

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DISCUSSION.

Dr. Bliss: Since Dr. Watson reported this operation, it has been a favorite of mine, among the several forms of operation that I employ. I think that there is no one operation that we can rely on in every case. I can speak in the highest terms of the results that I and others have obtained from this operation, and I am glad Dr. Watson has brought it again before the society.

It seems to me that it is well for us not to forget the older methods of operating upon deflected nasal septa. The new operation of sub-mucous resection is being not to say overdone; but it is a fact that the younger men are using it to the neglect of many of the older and well-established methods which have been the product of long years of experience and an infinite number of satisfactory results. I do not want to say anything against the submucous operation, for it applies to a certain class of cases; but for the angular deflections, Dr. Watson's operation is ideal. I do not thing it works in rounded deflection of the septum, which is without angles, so well as the Asch operation; but for the angular deflection, I do not think that any other can be so quickly done and is so satisfactory or permanent in its results. Dr. Watson's name alone should be associated with this operation, for I believe that he deserves the credit for devising it.

Dr. Mayer: This operation has been confused with the name of another operation, and has gone by the name of both combined, more than with Dr. Watson's own name; although I have always felt that it was the Watson operation. I can commend it very highly. I recall very well his first description of it before this Association, and I frequently perform it, especially in young children. I know of no form so well adapted to the deformities of the cartilaginous septum as that described by Dr. Watson.

I should like to lay stress upon one point in the operation, and that is the freshening of the edges of the floor on the concave side, after having performed the operation on the convex side. I find that having freshened the edges has given a double opportunity for holding the part pushed over into the concavity. In packing, having in mind the suffering that the patient must experience in having the nose packed with solid gauze for four weeks, I use a piece of rubber tubing, which helps to keep the part well over, if it properly fits the nose.

The operation described by Dr. Watson has not been forgotten. When we sift the matter we shall find that there is no single operation that is going to answer all purposes, and that for the deformities or the conditions that follow accident, and for the relief of external deformity, even more than of obstructed breathing, operations of this character will be done for time immemorial.

Dr. Casselberry: I want to know whether Dr. Watson cannot devise, in connection with this operation, some method of doing at the same time as the main operation what he sometimes seems to have to do afterwards. He tells us that if there is a sufficient thickening along the long part of the horizontal cut to protrude into the nostril of the convex side after the healing, it has to be taken off, as a spur would. This means operation No. 2 for the patient. I have to apologize when I have to do a second operation, especially in children. It would seem that Dr. Watson's operation would be ideal, if he could do it at one sitting.

It is a very useful operation. I have had frequent opportunity to test it. I had occasion last year to testify to its usefulness in children under general anesthesia. It can be done quickly, efficiently, and without difficulty. I prefer to operate on children under general anesthesia.

As I remember the operation, which has come down to us with a hyphenated name, the incisions went all the way through the septum—through the muco-perichondrium of the concave side. I have done it without going all the way through. Now, I understand, Dr. Watson goes through only one side.

Dr. Watson: By preference I do so; but sometimes it is not possible.

Dr. Casselberry: My difficulty was that when I wanted to go through only one side I could not make the fragments lock. I had to go a little further back. I extended my incision with a saw, in order to get far enough back to make it lock.

Dr. Ballenger: I wish to speak favorably of this operation. I have often performed it in years past, and had the pleasure of performing it only a week ago, with satisfactory results. My name has become connected with the submucous operation through the accidental invention of a little instrument, and the impression might be that I am wedded to that operation to the exclusion of all others. I am not. I have frequently performed the Watson operation, the Ash operation, the Kyle operation, and others; and I think that in the near future I shall probably do a larger proportion of these operations than I have in the past.

When one takes up a new operation one tries it in all sorts of cases. I have probably used the submucous resection in cases in which in future I shall perform the others. I think with Dr. Watson that when we can save the framework of the septum it is best to do so. I had a slight sinking-in of the nose about two months after a submucous resection, not having made due allowance for the chondritis that undoubtedly followed the injury. In the class of cases described by Dr. Watson his operation is a very desirable one, and one that should be chosen for the purpose. I simply wanted to place myself in the proper light before the Association, and not be misunderstood—although I do not know that I have been at all—as to my position on the subject.

Dr. Myles: I have never exactly understood from the history of this operation that it was the Watson operation. Probably Dr. Watson will explain it to us. My understanding was that Dr. Watson never cut through the mucous membrane on the other side. Dr. Gleason always did. There was a great difference between the two procedures. Dr. Asch's operation, also, was always confined to the cartilaginous septum. Those that use his operation perform another, in addition; that is, breaking up the bony septum.

In 1896 I read a paper on the Sub-Perichondrial Operations of the Nasal Cartilage, in which I described certain results. As long as I confined myself to the cartilaginous septum I had no trouble, but as soon as I tried to perform a bony operation in connection with it I got myself into difficulties. In two cases that will be reported by friends of mine there were deaths following the submucous operation. The deeper the operation on this bony septum the more serious it becomes.

A thing that bothers me very much is the perpendicular plate of the ethmoid, which is a difficult bone to manage. I have had to remove up to the cribriform plate, near the nasal bones, and divide the plate of the ethmoid; and I have always felt apprehension in such cases. In olden times, in doing that which I was trying to get by the internal route, I sawed and drilled it off. Even then I was apprehensive. When one considers that the meninges of the brain depend through the cribriform plate down on the middle turbinal, we must be apprehensive in such circumstances. Does Dr Watson perform his operation on the cribriform plate of the ethmoid in such a manner as to relieve this apprehension? His operations are ideal in certain cases.

We have so many instances in which we have to do a series of operations that it would be well if we could do these two at once. In order to clear the field thoroughly, it frequently happens that we should not attempt to do too much at one time; so we do three or four operations, instead of one.

Dr. Cohen: I have a great predilection for this operation, from which I have seen most excellent results. Dr. Gleason's operation includes a vertical incision behind, and in front a longer one, which makes it a more extensive one; then he puts in his finger and forcibly breaks the bone. I have seen serious cerebral trouble follow that procedure. When it did happen it gave a great deal of anxiety. Reference has not been made before in the discussion to the difference between the Watson and the Gleason operation. What is called the Gleason-Watson operation includes the additional vertical incision behind, and a large vertical incision in front, so that the cut has a squared "U" shape.

DR. B. ALEXANDER RANDALL: If it is permissible for a visitor to venture a word, I think that there is a point that has great bearing upon this subject; and that is the marvelously straight piece of the septal cartilage that we obtain after removing what was a markedly angulated cartilaginous portion. As soon as we have stripped off its mucous membrane, the cartilage straightens itself in a marvelously satisfactory manner.

The operation as now presented by Dr. Watson, in laying stress upon the carrying out of the procedure without perforation of the mucous membrane upon the concave side, is virtually a submucous operation on that side; since there must be a considerable detachment of coverings, so that the part shall slip over.

As I have understood the Gleason operation as contrasted with the Watson, Gleason is particular that there be a horse-shoe largely vertical, behind and in front of the deviation, to overcome the resilience. He also rather avoids getting the flange, which is the pride of the Watson operation. If this point of the relatively submucous work of the Watson operation is borne in mind, we shall see why it is as satisfactory as it is.

DR. WATSON (closing): In answer to Dr. Mayer, in regard to freshening the concave side, I would say that I think that is a pretty good idea. Not cutting the mucous membrane of the concave side, however, accomplishes the same result. When the parts are pushed over, the muco-periosteum is stripped up from the base, allowing the cartilage of the other side to fall down between it and the cartilage of the base. That denudes that portion and makes it adhere again. This is one advantage of not cutting the mucous membrane, and another is that it keeps the other nostril free from blood. If there is any danger of a perforation following, this is also obviated largely by this mucous membrane's being left intact.

I think that Dr. Cohen or some other speaker spoke of the Gleason method of doing this operation, mentioning the fact that it cuts the mucous membrane on the other side. I always used to cut it through at first, and did not think of saving the mucous membrane on the concave side. This is a refinement of the operation, but I do not insist upon it. It makes a nicer operation.

Dr. Casselberry spoke of the spur removal. When I first did the work I removed the spur at the same time; and I sometimes do this still, when it is marked and constitutes a thick mass extending into the other nostril. Occasionally you will find a case in which you are undecided as to how far to go, and in such cases it is better to let it remain and do the operation, if necessary, later. Sometimes it rounds itself off in healing, and it is not necessary to do another operation. In the thinner deflection, in which we have the hardest time to make the overlap stay overlapped, breaking the lower portion of the septum which is left and straightening it up will obviate the difficulty. It removes the projecting portion and increases the lapping of the parts.

Dr. Makuen: Why not remove the spur before the operation?

Dr. Watson: Because we want to utilize all the straight part of the septum. It is practically straight down to the angle, and all below is bone, at the suture between the vomer, the triangular cartilage, and the perpendicular plate of the ethmoid. We get the cartilage just above the bone, and do not have to use the saw. Occasionally there is a spicule of bone. The saw does not leave a good operation, because it goes through in a straight line, and one cannot make the proper curve underneath the overhang.

Dr. Mayer spoke about packing. I have used all kinds of splints and packing—the rubber-tubing, the gutta-percha molding, hard-rubber splints, etc. The latter are not made for the particular nose upon which you are working, and are sometimes too large in front and too narrow behind. Therefore I prefer the gauze. I do not find it at all disagreeable to the patient—not so much so as a hard dressing. It slips in and out easily, and can be greased after the first dressing. It does not have to be tight. In the cases in which the results are the most successful there is no necessity for any packing. There is a danger that the patient may blow his nose and produce hemorrhage. I put the gauze in partly to avoid this danger. Otherwise, in most cases the parts will stay in position by themselves.

Dr. Myles spoke of the perpendicular plate of the ethmoid. These are the cases that I excepted from this operation. I do not know of any better way to remove the deflection than to cut away the curved bone by the submucous operation.

Dr. Randall has said that Dr. Gleason, in doing the operation, does not make a bevel. He does not do this intentionally, but he does do so; in sawing up he makes the bevel. He came to me after he had published his article and acknowledged that it was the same operation as mine, with no difference so far as the principle goes—the principle of overlapping and the beveled incision. I should have had no objection to his claiming all that is his own. Most of it is mine, however; and he knew my operation before he ever thought of his. That is why I objected. I want mine to stand on its own merits, and I want credit for that part which is mine; anyone else can have the rest that wants it.

Local Anaesthesia in Operations on the Maxillary Sinus. By GORDON KING, M. D.

The author finds the use of a general anaesthetic in operations about the antrum not only a source of unnecessary risk to the patient, but a most annoying hindrance to clean and rapid execution of the operative procedure. In performing the radical Caldwell-Luc operation on the maxillary sinus practically complete anaesthesia can be obtained in every detail of the operation by the judicious use of cocaine and adrenalin, and with such rapidity as to enable the operator to finish the operation within twenty minutes. With a general anaesthetic much delay and inconvenience is caused by the flow of the buccal secretions and blood, and by the occupation of the operative field by the anaesthetist's cone.

An important point in the technic is the injection of the anaesthetic mixture into or around the trunk of the infra-orbital nerve, which insures analgesia of almost the entire field of operation.

Within the past two years the author has employed this method exclusively, and finds it safe and satisfactory from every point of view. A. A.

DISCUSSION.

DR. MYLES: In the last fifteen or twenty years I have operated in two hundred cases on the antrum of Highmore, and in the series of cases operated on eight or ten years ago I do not think that more than two per cent. of the operations were done under general anesthesia. All the rest were done by the local method. I used a two to a four per cent. solution then, but I have gradually diminished the strength until I have got it down to one-eighth or one-tenth per cent. The mucous membrane was thoroughly anesthetized with the cocaine and adrenalin, and this makes the operation practically painless, unless you get near some dental nerve. I have tried some cases with water, and the result seems to be good. This is due to the pressure of the water on the nerves.

Within the last few years I have done not more than ten per cent. of operations through the canine fossa; the others I have done through the inferior nasal. In that class of cases we use the light platinum needle introduced under the inferior turbinal, or after a section of it has been taken off. It is well to introduce the cocaine and adrenalin into the small hole in the antrum, for the most pain is in the antral mucosa. It is remarkable what an anesthetic condition is produced by so weak a solution; but even with the strong solutions I have never noticed much constitutional effect. There is a great deal in the method employed. I do not believe in putting cocaine on a region upon which I do not intend to operate. To spray it on the nose diffusely, or where it will discharge into the nose, will produce a much worse constitutional reaction with a weak solution than would be produced by using a strong solution on a small swab, and not letting it flow out upon other spots. It should be held in the proper place with a small pledget of cotton.

So far, I have nothing to regret in the use of local anesthesia. I am a sort of chronic "knocker" on the question of the death rate from general anesthesia. Since I have belonged to the brotherhood I have been able to get more evidence of this than can be obtained from the papers. If you have once lost a patient in this way, your friends are willing to tell you about those that they have lost, and it is surprising to find how many there are. Within the last few weeks a friend of mine had a very sad case of the kind. It is not right to blame the result upon the anesthetist, for it is due to the operation. When you take the responsibility of ordering the giving of a general anesthetic you must take the responsibility of the death. The anesthetist is doing what he does under your direction, and the responsibility for the result must be assumed by you.

DR. CASSELBERRY: From a limited experience with the radical operation through the canine fossa I can testify to the efficiency of local anesthesia. I have done the operation through the canine fossa under local anesthesia but once, and that was in the case of an old man to whom I hesitated to give a general anesthetic. It, however, took me considerably longer than Dr. King has stated, probably because I am not so experienced with the local anesthesia method as he is. The anesthesia was satisfactory in every respect, except in the curetting of the interior of the cavity, which was painful to the patient, notwithstanding the efforts I made to apply the cocaine within the cavity. I do not think of making any effort to inject the cocaine into the region of the infra-orbital nerve, but I have no doubt that this would be a very useful addition to the procedure. I shall adopt it in future if I have occasion to do so.

DR. BLISS: I should like to ask Dr. Myles whether that fatal case afer general anesthesia occurred after the use of ether or of chloroform. I have been very much impressed by his statement. It is astonishing how very rarely any of us have untoward experiences after the use of ether. I should be very much pleased to have him tell us what anesthetic was employed.

Dr. Myles: I was not present at the operation. One instance was a case in which I was consulted. The patient died a day or so after the operation, and I was informed of it. The other instance was very recent, and my friend just told me that the patient had died after the operation. I did not ask particularly concerning the details of the administration of the anesthetic.

Dr. King (closing): I should merely like to emphasize one point about this method. Not only is it a question of getting thoroughly efficient anesthesia by means of cocaine, but the use of a local anesthetic also facilitates the operation. The greatest obstacle in doing these operations about the mouth with a general anesthetic is the secretion, especially creating the necessity of repeatedly cleaning out the throat. The wound is constantly reinfected by the secretions. This is obviated by the use of local anesthesia.

As to the time of the operation, which Dr. Casselberry spoke of, I find that I can do it in half the time that it would take under general anesthesia, because it does not take so long to give cocaine, and the rest of the operation can be done without stopping for further anesthesia—except in the interior of the cavity, which is the most sensitive point. If you begin by making a little opening it is not painful at all. Then, before you begin to open it up largely you can inject a ten per cent. solution of cocaine. By the time you have it thoroughly opened the part is pretty well anesthetized. If not, swab in a stronger solution on the interior surface of the cavity.

Myxofibroma of the Naso-Pharynx, Causing Disfigurement. Report of a Case and Exhibition of Specimen. By D. Braden Kyle, M.D.

The common site of origin of Myxofibroma of the naso-pharynx is from the basilar process of the occipital bone. It may extend upward or downward and the rate of growth varies. The symptoms vary according to the direction of the extension.

Dr. Kyle reported a case and exhibited the specimen removed. The growth in this case was pedunculated, and had its origin at the posterior end of and underneath the right superior turbinate body. It had extended chiefly in the right nares, completely blocking it and by deflection of the bony septum to the left it occluded the left nostril also. Removal of the growth was almost without hemorrhage, and was followed by complete recovery, six weeks after operation the nose appearing about normal.

DISCUSSION.

Dr. **Farlow**: One symptom that occurred in a patient of mine, and did not occur in Dr. Kyle's patient, is extreme change in the voice. My patient was a man nearly sixty years of age. I inquired his name, which he said was Mr. Batson, and I wrote it down that way. He saw me do it, but made no remark. I found his postnasal space filled up with a growth, which was larger than the one from Dr. Kyle's case. I had considerable difficulty in removing it. I could not get it out with a snare, but had to use the forceps. I pulled the tumor down, got hold of the pedicle, and cut it off that way.

As soon as it was over, the man said: "You remember that you wrote my name down as Batson. My name is Matson. I have had this trouble two or three years, and since it began I have moved to another place. Where I formerly lived everyybody knew me as Matson; but where I now reside they all call me Batson. When letters for me come addressed to Mr. Matson, the postoffice authorities do not know whom they are for." I was greatly surprised to find that, although there was still great weakness, the character of the voice changed immediately after the operation.

Dr. **Watson**: Ten years ago I had a case like this, except that the growth was more extensive. It hung down from the nasopharynx, and when it was removed the body of the growth from the pharynx measured about six inches in circumference. It also involved both sides of the septum, and extended into the antrum on one side. It was producing some protrusion of the face on that side. The interesting part of this case is the treatment.

First, I removed with the snare the large mass that filled the nasopharynx. Then the entire vault of the pharynx was found to be covered with this filth. I tried to strip it off with the tearing forceps, but was unable to tear away only a small piece at a time. As fast as I cleared it away it was reproduced, and it continued to increase until I began to use the electric needles, one in front of and one behind the growth. I did this two or three times a week for four weeks, and then the patient went home. After a month or two he came back, and I found that the growth had diminished. I gave him another treatment, and he later wrote me that he could breathe freely, and that the mass had gone down on the side of his face. I presume he is well now, as I have not heard from him since.

Dr. King: I simply want to mention a case of myxofibroma removed recently. A tumor about the size of a large pigeon egg had made considerable deformity of the face, and when it had been removed I found it to have been attached by a pedicle to the alae of the nose.

Dr. Lincoln: I recently saw a case similar to Dr. Kyle's in hospital work, and I wish to bring out the point that all cases are not so favorable in regard to blood-vessel distribution. In mine, adhesions had taken place all over, and operation by means of intranasal snares and forceps was impossible. I had to remove the nose from the face and lay it over on one side, which permitted of a free access to the tumor. The adhesions had to be separated with the spatula, and the cautery had to be used. It required a great deal of packing. I was glad that, in removing the nose, I had cut in upon the surface of the sound side, for when it was replaced upon the face the inevitable suppuration did not come through my wound, but was discharged into the pharynx. The tumor was not entirely removed in the nasopharynx, but it afterward yielded to treatment with the electric needle.

Dr. Swain: How firm was the tumor? It seems unusual to have deformity from such a soft tumor as a myxofibroma.

Dr. Mackenzie: Some years ago, at the University of Maryland, I had a large fibroma of the larynx, which seemed to be rooted almost everywhere. I attempted to remove it with the cold wire snare, but broke three snares in the attempt. I broke practically every instrument I had, and finally decided to pass it over to the Professor of Surgery. I did so, and he did a modified Langenbeck, dissecting the growth out in that way. It was found that it would have been absolutely impossible to have removed it through the internal route. A very large artery was severed, and blood spurted all over the table, but the hemorrhage was finally controlled.

This case proves the truth of what Dr. Lincoln has said, that these growths are sometimes impossible to remove through the internal passages, because they are rooted in so many places. If I had severed this artery in removing the growth, and had had the serious hemorrhage that followed, it would hardly have been possible to have controlled it.

Dr. Casselberry: I wish to call attention to the fact that the discussion seems to have embraced two classes of growth: those we have heard about from the last speaker belong to the class of nasopharyngeal fibroma, and those concerning which the paper was written are the myxofibromata, which dip into the nasopharynx. The two conditions should not be confused, because the treatment of one is entirely different from that of the other.

Dr. Mackenzie: I stated that my case was a pure fibroma.

Dr. Kyle (closing): I did not refer particularly to the change of voice, but merely referred to it as the typical nasal twang.

In regard to the point made by Dr. Swain, these tumors are certainly very soft; and it has also puzzled me why such soft masses could cause so much bony displacement. Myxofibromata are not very vascular. There was practically no hemorrhage in this case. The patient made a good recovery, but whether there will be any return I cannot say, as it has scarcely been six months since I removed the tumor. I have frequently removed larger growths from the nasopharynx, but the fact that this soft growth grew forward, causing bony displacement and external deformity, was rather unique.

A Case of Epithelioma of the Tongue; Operation; Recovery. By Robert C. Myles, M. D.

The case reported was of a man, aged 64, with a cancerous growth about one inch in diameter on the left side of the tongue. Before operation iodide was exhibited, eighty grains three times daily for three weeks, without effect. At the operation the superficial and deep cervical glands and the submaxillary salivary and lymphatic glands were first removed and much of the connective tissue along the jugular vein and carotid arteries was excised. Then the tumor was removed with a margin of healthy tissue from one-half to one inch in all directions.

The microscopic diagnosis was of a squamous-celled carcinoma in early stage.

DISCUSSION.

Dr. Bryan: I have been very much interested in malignant disease of the tongue, since I have had some very unfortunate cases. I reported two cases that have turned out badly, and a brief history of them may not be out of order.

In one I discovered on the lateral border of the tongue an ulceration that had been in existence six months. All the doctors that had been consulted had considered it a stomach ulcer. The disease, however, had shown no tendency to subside, and I recognized the condition and sent the patient to London. There Mr. Butlin removed half the tongue and part of the floor of the mouth, and three weeks afterward the cervical glands on the affected side. There was no glandular enlargement perceptible by palpitation at the time of the operation on the tongue, and no enlargement was evident microscopically in the glands of the affected side after their removal.

The patient returned to this country, and did very well until the first of last March, when he discovered a small enlargement on the opposite side of the neck. Within two weeks after this there was a very rapid development. Dr. Kerr, who was called in, did a complete operation, and found an enormous mass at the junction of the carotid on the opposite side. The carotid and the jugular were thoroughly imbedded and had to be excised. The man died of pneumonia forty-eight hours after the operation.

The second case was one in which the growth was at the base of the tongue, and was operated on by the Kocher method. Recurrence took place six or eight months afterwards.

I have recently had a third case operated on, and the patient is now doing as well as possible in the circumstances.

Regarding early diagnosis, it seems to me that the fate of the patients depends upon the early recognition of the disease. The cases should be recognized in the precancerous stage. Is there such a stage? Must we operate before we are convinced that the disease is malignant? I do not believe that we can ever say that a patient is cured of malignant disease occurring in the upper air passages of the tongue until three or four years have passed since the operation.

Why the disease should occur on the opposite side is evident from the anatomy of the tongue. It is rich in lymphatics, the circulation of which the raphe is not sufficient to shut off. In discussing the case with Mr. Butlin, he said that the glands on both sides ought to be excised, and that was also the opinion of Prof. Kocher. The case operated on in England did so well that we felt that the man would survive. The patient recently operated on by Dr. Finney is, I believe, also doomed.

Dr. Solis Cohen: There is a difference in the management of these cases. Some operators remove the glands at the time of removing the tongue, and others wait for two or more weeks afterward, or till cicatrization has taken place.

Dr. Mackenzie: It is growing more evident to the surgeons in Baltimore that, in order to complete the tongue operation, the whole floor of the mouth must be excised.

Dr. Bryan: Mr. Butlin removed the whole floor of the mouth, deep down into the larynx.

Dr. George E. Shambaugh: I had a case of cancer of the neck that seems to me to have been rather unusual. I think that the development of the tongue explains and clears it up. The anterior part of the tongue develops in halves, whereas the back part develops as a central piece.

Dr. Myles (closing): I believe that my case should have been operated on ten weeks before. Even if we have it ourselves, it is hard to get the idea into the minds of the patients that an excision should be performed at once. If we could do this we could more frequently report a cure.

Dr. Bryan has made the point of whether the pathologist is able to find evidence of the presence of malignant disease early enough to enable us to operate with the hope of cure. It seems to me that the microscopic evidence is there, and that the pathologist ought to increase his knowledge regarding incipient cancerous growth. There must be a precancerous stage, and what are its characteristics? I have asked a number of pathologists, and none of them seemed to know. One said that he thought I had had unlimited bravery to do that operation with the little evidence of malignancy that I had. The general appearance of the growth led me to believe it to be malignant. This did not consist so much in ulceration as in a peculiar hardness, which did not yield to the iodide.

I am not in favor of taking out pieces for microscopic examination. In this case the pathologist examined thirty sections before he obtained the necessary evidence. It is, however, a complete and perfect demonstration of the character of the growth. The man certainly would have lost his life. I do not say that he is cured now. The question is, can we help a few patients to get well? If we can cure a few, we shall feel encouraged to operate on others.

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THE ESSENTIALS OF VOICE PRODUCTION.*

BY WESLEY MILLS, M. A., M. D., MONTREAL, CAN.

I wish to assure you that I much appreciate the honor you have done me in inviting me to prepare a paper for this meeting, in spite of the fact that I have long been out of the ranks of practising laryngologists.

I was led to enter on my short career as a laryngologist almost entirely from a love of a study of the voice, and the desire to be of assistance to those who use the voice in public. As a matter of fact, such persons constituted the majority of my patients. Having, from the age of sixteen, made a practical study of voice production, and worked out many results wholly by experiment on myself unbiased by the theories of others, I was in a position to judge of the causation of many of the troubles for which speakers and singers came to me, though sometimes I went to hear some of these patients speak in public purely for my own satisfaction that I might be the more sure on the question of causation.

My interest increased, I began to read all I could lay hands on that bore on the subject of voice production—and I must say I never misspent the same amount of money on other books as on those bearing on the voice, as it was treated twenty years ago by others than physiologists and laryngologists, speaking generally. Being enthusiastic and determined to know the truth, I carried out some laborious investigations, and practiced auto-laryngoscopy industriously, and I think very profitably. Up to the present hour my interest has kept increasing, especially as I have always been a practical musician, and music is to me as daily bread. I have preferred to give you a little of my own history rather than to attempt to prescribe what shall be the attitude of the laryngologist to this subject, so far as his own studies are concerned.

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*Read at the 30th Annual Congress of the American Laryngological Convention in Montreal, May 11-13, 1908.

That his patients will appreciate real knowledge of the voice, my experience gives ample warrant, but to influence them much he must show a sympathy with and some knowledge of music—sound as far as it goes. He may choose to say nothing to his patients that bears on the subject of voice production—he may simply draw his own conclusions as to the method of the speaker or singer after the necessary inquiries as to his teachers and methods, or he may take a bold stand and feel it his duty to prescribe a change as to both. Were I myself to again return to the practice of laryngology, I suspect that I would often do both, though aware that this might not put money in my purse. It produces in my mind an indescribably wretched feeling to know that the methods a young person of a naturally good voice and sound vocal organs is pursuing must inevitably lead to the ruin of that voice. In such a case there would be for me but one course to take. I do not prescribe for others.

In dealing with the essentials of voice production, I think your confidence in what I have to say may be largely in proportion to the fewness of the principles on which I insist as essential. When one reads or hears accounts of the "methods" of teachers and finds that they differ, or seem to differ so much, one naturally asks: "Whom of all these professed experts are we to believe?"

Oliver Wendell Holmes held that the medical was the most sensible of the professions, so I presume that if I am to prove worthy of your confidence, I must so present what I consider either as essential or very important in such a way that it shall at least seem sensible.

I remember when a youth hearing a man of considerable attainments and ability say that he could tell all he knew about any subject in five minutes. This statement caused me to marvel then, but it is not so mysterious now. Although I have been studying the subject theoretically and practically all my life, I feel satisfied that I can state all the essentials in five minutes or less. Such statements might, however, be so imperfectly comprehended that they would serve no enlightening purpose. But just to put the matter in this brief form for the moment, I should say that to realize that speaking and singing are in essentials the same—that physiological adjustment of the various parts of the vocal organs is the keynote of the whole—that practically all respiration exists for the expiratory blast—that the principal adjustment is between the expiratory action of the respiratory mechanism and the vocal bands, known as "the attack"—that this is completed by a further adjustment of the upper or resonance chambers to the parts below—that one speaks with the tongue—that one must on no account speak with the throat—that he must speak from the throat into the resonance or upper chambers—that is, he must speak towards his face—that he must especially speak and sing with that part of his mouth cavity lying between the soft palate and the teeth—that he must keep the back of the throat and the front boundaries of the mouth cavity out of the way—that he must never strain or use more force in phonating than the organs can bear without suffering—that artistic speaking and singing are always physiological—that vowels alone are musical, and that consonants are nuisances, necessary and deserving of close attention.

Having said this, what remains further to be said that is really vital? Now, perhaps, I cannot do better than attempt to illustrate, as I would do to a body of intelligent medical students who had completed their second year, and who were at once musical and interested in the voice. I think I should say to them:

That the key to the understanding of respiration is to remember the great importance of the diaphragm and the lower chest;—that the key to the complex movements of the larynx is found in the relations of the vocal bands to the arytenoid cartilages, the analogy to the universal-joint-action of which is especially to be borne in mind.

Most voices, especially in America, are somewhat lacking in resonance. It is important, therefore, that the student of the voice understand this subject, and I find some such simple illustrations as the following at once interesting, easily remembered and convincing. (At this point a violin, with and without a mute, an imitation violin and a cylinder and tuning fork, were used to illustrate resonance. The speaker's voice was also employed to make some points clearer, and certain principles were expanded by additional remarks.)

The fact that vowels alone are musical, and that consonants cannot but be the reverse, follows from the simple fact that the former all call for the open mouth, and the latter all close the mouth, more or less, and interrupt the breath stream. Vowels are learned first; the infant cries on a vowel sound, and consonants come later—a hint to teachers of voice production.

Many persons in their zeal for good consonantal utterance forget that there is danger in dwelling on the initial consonant of a word, the effect of which may be to keep the mouth too long closed, or to leave it imperfectly opened on the vowel, so that I urge that the voice student bound off the initial consonant, and get the mouth open on the vowel. This is especially important for the singer who prolongs sounds to a much greater extent than the speaker. Indistinctness does not usually arise through inattention to the initial consonant of a word, but to the final one; and in a large building it is better for the speaker to dwell only moderately on final consonants, and to make frequent and somewhat lengthy pauses so that the listener may be enabled to hear not only the last word, but to grasp the entire phrase, and not feel himself under constant tension in order to follow the speaker at all.

It is much to be regretted that speakers are not equally convinced with singers of the importance of the study of technique, or in other words the movements of the vocal organs necessary to the best results. An enlightened singer thinks it necessary to spend years in acquiring technique, but any such conviction on the part of a speaker is of the rarest, and with corresponding results.

The time was when a man could go to the theater and hear our noble English tongue nobly uttered, but that is only a memory. Where are the Booths, the Macreadys, the Modjeskas of to-day? Although the American nation excels perhaps all others in the amount of energy it puts forth, it is positively lazy and indifferent as regards utterance. The negro is proverbially indolent, and his speech corresponds to his nature. In some cases his consonants are all but non-existent; but many white people make fairly good seconds to the negro in this respect, and the nation from one end to the other, and Canada must be included in this indictment, is given to nasality, owing to the laziness that allows the tongue to roll up and back, and the soft palate to drop and meet it, so that the breath stream must pass through the nose.

Thus bad utterance is so common that it is little noticed, indeed, almost anything passes even with educated people, among us so long as it be not ungrammatical. There is an almost universal vitiation of taste as regards vocal utterance, and an equally widespread indifference—and I only refer to what you all know in the hope that we may be more fully resolved to set our faces against this, and to cry out for reforms which must begin in the home and in the school.

I lay great stress myself on exclusive mouth breathing in phonating. Some have made a fetish of nose breathing because it is "natural." It is, under ordinary circumstances—but speaking and singing are only natural processes in a secondary sense. The lower animals do not employ them, nor does man do so all the time. In mouth breathing the tongue flattens, and the soft palate tends to rise, and the totality of the mouth parts are put into the best form for the utterance of pure vowel sounds. Nasality becomes almost difficult under such circumstances, while in the absence of mouth breathing it is very difficult of cure.

There is no real objection to mouth breathing, except when the atmosphere to be inhaled is either very cold or very impure. It is not to be adopted for outdoor speaking. I find that it greatly facilitates good results in both singers and speakers, although in some instances bad habits can only with great difficulty be overcome, if nasal breathing be employed.

It will be seen then that the whole question of good voice production hinges on physiological adjustments of a certain kind, so that there is economy of energy and ease on the one hand, and pure tones on the other. Nearly all faulty methods tend to produce venous congestion with a corresponding starvation and poisoning of the tissues of the vocal organs, owing to the simple fact that the blood is kept too long in the capillaries. One may say that all proper use of the voice is physiological, while all methods giving bad artistic results are physiologically unsound.

This is another way of saying that one part of Nature is not in antagonism with another part. Good speaking or singing is at once natural and unnatural. Unnatural because it is never attained by the untrained man—natural because the processes must be in harmony with the laws of the body and the mind.

McGill University.

THE DRAINAGE MECHANISM OF THE NORMAL ACCESSORY SINUSES.*

BY SIDNEY YANKAUER, M. D., NEW YORK CITY.

With the exception of a few sentences scattered here and there through the literature, little has been written upon the subject of the drainage of the normal accessory sinuses. This drainage is dependent upon certain physical and physiological laws, which it is the object of this communication to place before you for consideration and discussion, in the belief that a fuller knowledge and understanding of the normal drainage mechanism of the nose will help materially in solving some of the difficult problems.

Although the nose secretes daily several pints of sero-mucous fluid, only a small portion of the fluid comes from the accessory sinuses. In the nasal passages this fluid disappears by evaporation; but as the conditions for evaporation are not favorable within the sinuses, it follows that the secretion of the sinuses must be discharged into the nose. The fact that the sinuses are thus capable of draining themselves when they are in a normal, healthy condition will hardly be disputed; but that they are also capable of emptying themselves through their natural orifices when they have become diseased may not be so self-evident. Yet it is within our experience that acute inflammations of all the accessory sinuses have a natural tendency to get well without operative interference, the end of the disease being marked by a discharge of secretion into the nose, lasting for days or weeks, during which time drainage through the natural orifices goes on without interruption; so that even when the mucous membrane is diseased and the quality of the secretion altered, drainage through the natural orifices is possible, and in a large percentage of the cases is sufficient. We may, therefore, assume that in these cases the normal drainage mechanism has not been destroyed, and by following the course of the secretion in these cases some light is thrown upon the mechanism of normal drainage.

The first factor to be considered is drainage by gravitation. By this term I mean the direct outflow of the secretion by virtue of its weight. A fluid collecting in an accessory cavity naturally seeks to follow the law of gravitation, and to collect in the lowest part of the cavity. It cannot flow out of the cavity until its level reaches the level of the natural opening, or until the position of the head is changed so as to bring the natural opening below the level of the fluid.

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*Read before the Section on Laryngology and Rhinology of The New York Academy of Medicine, April 29th, 1908.

The opening of the antrum is situated near the upper part of its internal wall. Hence, secretions cannot flow out of this orifice, in the upright position of the head, until the antrum is nearly full of fluid. The lower half of the antrum, however, is larger in volume than the anterior half, so that an accumulation of fluid, which is not high enough to reach the natural orifice in the upright position, may escape through this opening when the head is bent forwards. Complete emptying of the sinus can only take place when the head is bent toward the opposite side.

In the case of the frontal sinus, the opening is favorably situated when the individual is in the upright position, or when he lies upon the opposite side; but even when the naso-frontal duct is typical in arrangement, the drainage by gravitation is obstructed by the long and narrow passage through which the fluid must pass. This is equally true when the fluid must first pass through an ethmoid cell.

The anterior ethmoid cells open into the hiatus semilunaris, or between the bulla and the middle turbinate, each, according to Hajek, by a separate opening. This opening is sometimes situated near the floor of the cell, sometimes high above the level of the floor; but there are many deeper cells which open into each other and into the superficial cells in a variable manner, so that there is no position of the head in which the ethmoid labyrinth can completely empty itself. The posterior ethmoid cells are similarly situated, in reference to their outlet.

The opening of the sphenoid sinus is at the upper and outer part of its anterior wall, so that fluid can flow from this sinus only when the head is bent forward or toward the same side.

It is, therefore, evident that there is no single position of the head which is favorable to drainage from all the sinuses. During sleep, drainage from one-half of the sinuses would be favorably affected if the individual rest upon the side. During waking hours, in the occupation of most individuals, the position of the head varies sufficiently to cause frequent changes in the position of the fluid in the sinuses, and in this way the drainage of one or another of the sinuses may be temporarily affected in a favorable manner.

On the other hand, even when the head happens to be in such a position that the natural orifice of any particular sinus is at its most dependent portion, the escape of any contained secretion can, at best, be only slow and intermittent. For, when a liquid flows from a vessel with a narrow outlet, it escapes in jets. Each jet is followed by the entrance of a bubble of air into the vessel. If the surface tension of the liquid is low, the jets and bubbles follow each other in rapid succession; but if the liquid is thick and viscid, like glycerin, for instance, or like the nasal secretions, its escape will be very slow; in fact, if the opening is very small, there may be no escape of liquid at all.

Now, there is but one small opening into each sinus. Hence the escape of secretion from the sinuses is slow, each drop being succeeded by an intermission, during which a bubble of air enters the sinus. In persons who have excessive secretion in their sinuses, this bubble of air may give rise to a sensation, or to a noise of which the individual is distinctly conscious.

Considering these facts, and bearing in mind that the secretion of the healthy sinuses is a mucous fluid, and that of the diseased sinuses a still more viscid one, it is evident that gravitation, as such, plays a very small part in the drainage of the normal accessory sinuses, as well as in the drainage of those diseased cavities in which restoration to health takes place without operative interference. On the other hand, the explanation of the manner in which these cavities *are* drained, must be sought in a study of the character of the mucous membrane over which this drainage takes place, and of the physical properties of the secretion.

With the exception of the olfactory tract proper, the mucous membrane of the nose and its accessory cavities is covered with ciliated epithelium. The cilia are in a state of constant motion, which has been compared to the lashing of a whip. Each cilium moves through an arc of from 20 to 30 degrees, at the rate of about 12 times per second, the forward movement being about twice as rapid as the return movement. All the cilia of a single cell move in the same direction at the same time, but the cilia of all the cells do not move simultaneously, but the motion is carried over the mucous membrane in a wavelike manner. The movement of the cilia is maintained and governed by the nucleus of the cell. It is favored by heat, by a proper degree of fluidity, and by an alkaline reaction of the secretions; it is retarded by cold, by dryness, by viscidity of the secretions, and by various chemical reagents. The direction of the ciliary motion is always toward the external orifices of the body; in the accessory cavities it is toward their natural orifices. The power exerted by the combined action of the cilia is said to be very considerable.

By means of this ciliary motion, the secretion covering the mucous membrane is kept constantly moving toward the natural openings and into the nasal passages. Ciliary activity is therefore an important factor in maintaining the drainage of these cavities. The fact that diseases, in which the cilia are destroyed, such as the various forms of atrophic rhinitis, are frequently associated with accessory sinus diseases, would be an instance.

In some of the sinuses, and in favorable positions of the head, the activity of the cilia is in a downward direction, and is favored by gravitation; but in other sinuses, and in many positions of the head the fluid must be driven uphill, and in such cases the upward motion of the fluid is favored by the fact that the secretion is exuded from all parts of the mucous membrane in small quantities at a time. For some of the secretion is exuded near the natural orifice, so that the distance which it must be moved is small; but this fact also brings into play a certain law of physics, as follows: When a fluid is present in large quantities the law of gravitation prevails, and the fluid flows downwards; when the quantity of fluid is small, so small that it is measured in drops, its gravity may be counteracted or even overbalanced by other properties, such as adhesion, surface tension or tenacity, capillary attraction and syphonage. These physical properties are common to all fluids alike; they are therefore true of the secretion of the normal sinuses, and of the diseased sinuses as well. Their influence in determining the drainage of the sinuses has not been touched upon in the text-books nor in other literature. We have, therefore, collected the results of clinical observation of these phenomena, and will present them in the order in which they seem to exert their action in the nose.

By adhesion we mean the power of attraction existing between bodies. Not every liquid can adhere to a solid, as, for instance, mercury and glass; when, however, adhesion between a liquid and a solid exists, as between water and glass, the liquid is said to have the power of wetting the solid. If a drop of liquid is placed upon a surface which it is capable of wetting, it does not remain stationary, but spreads over the surface; if the surface be vertical, it will rise upwards, contrary to the direction of gravitation, as well as downwards; this creeping of the fluid takes place more readily if the surface has been previously wetted with the liquid, for when it is dry, the adhesion of the atmosphere to the solid must first be overcome. In consequence of this power, a liquid contained in a vessel which it moistens, will rise along the sides of the vessel, so that the upper surface of the liquid is not flat, but is concave, presenting what is familiarly known as the meniscus. The height of the meniscus depends upon the degree of adhesion existing between the liquid and its container, and is greater when the surface of the container has been previously moistened with the liquid.

Now, in the nose the adhesion between the secretion and the surface of the mucous membrane is very great, for one of the main functions of the secretion is to keep the mucous membrane moist. Any secretion formed in the sinuses therefore tends to spread over the walls of the sinus. If secretion has accumulated within one of the sinuses, its surface will present a high meniscus, so that the level of the fluid where it comes in contact with the walls of the sinus will be much higher than in the middle, and the actual dimensions of the sinuses are such that the height of the meniscus is generally sufficient to bring the fluid up to the level of the natural orifice. In like manner the secretions rise out of the various depressions and pockets in the floor of the sinuses, and are able to surmount the obstructions presented by the partitions and septa which are often encountered. The rise of the meniscus is favored by the cilia; for the area of the mucous membrane is greatly increased by these numerous projections from its surface, and consequently the adhesion is greater. Moreover, as the direction of the ciliary motion is toward the natural orifice, the two forces always act in unison to bring the fluid to the outlet of the sinus.

If a liquid is contained within a tube the surface of which it can moisten, and whose diameter is sufficiently small, the adhesion of the liquid will overcome its gravity, and instead of flowing out of the tube, the liquid will rise in the tube contrary to the direction of gravitation. This phenomenon of capillary attraction is directly dependent upon adhesion and is subject to the same laws. In a tube of given diameter the height to which the liquid will rise depends upon the degree of adhesion between the liquid and the tube. With a given liquid and tube, the capillary attraction depends upon the diameter of the tube, the narrower the tube, the higher the liquid will rise. It is not necessary, however, that the capillary space be tubular in form; for these phenomena will manifest themselves equally well between any two surfaces which are near enough to each other. If the surfaces are parallel to each other, the liquid will rise to a certain height and its upper border will be horizontal. As the height to which the liquid will rise depends upon the distance between the surfaces, it follows that in a wedge-shaped space, the liquid will rise higher along the narrow side of the wedge. In fact, in a horizontal wedge-shaped space which is open below, a drop of fluid introduced into the open part of the space, below, will flow upwards until it forms a narrow band along the line where the surfaces meet. Capillary attraction is always greatest in the immediate neighborhood of points of contact.

Now, as soon as the secretion of the sinuses reaches the natural outlet, it encounters the capillary attraction due to the conformation of the outlet. The outlet of the frontal sinus is tubular in form; in this form the capillary force is greatest, and it is by virtue of this fact that the resistance due to the unusual length of the naso-frontal duct is overcome. The orifices of the antrum and of the anterior ethmoid cells, as well as the naso-frontal duct, open into the semilunar hiatus, a narrow space with parallel walls, which exerts a not inconsiderable degree of capillary suction upon the secretion which presents itself in these orifices. The sphenoid sinus and the posterior ethmoid cells open into the very narrow superior meatus, whose walls are sufficiently close together to exert similar attraction upon their secretion.

When the semilunar hiatus is visible, the secretion may be seen; for it accumulates in the wedge-shaped space formed between the rounded edges of the lips of the hiatus. The secretion does not necessarily accumulate in the lower part of the hiatus, but flows readily along its entire length, quite independent of gravitation. By virtue of its adhesion and its power of spreading over the moist surface of the mucous membrane, it flows downwards over the uncinate process and upwards over the bulla, and will next be found accumulating in the wedge-shaped space or groove between the uncinate process and lower turbinal, or between the bulla and middle turbinal. In this way the secretion is spread over the entire surface of the middle meatus, and as this is the main respiratory channel, the secretion will, if its quantity is not excessive, disappear by evaporation. On the other hand, when the quantity of secretion is excessive, its further course is of interest. If the middle turbinal is large, the space between it and the outer nasal wall, and between it and the lower turbinal, becomes a capillary space. Owing to the rounded outline of the turbinals, this space is a wedge-shaped space, the angle of the wedge becoming more acute above. As the secretion must follow the law of capillary attraction and accumulate in the narrowest part of a wedge-shaped space, it will sometimes happen that the only visible accumulation of secretion will be found high up in the angle between the middle turbinal and the agger nasi. The fact that secretion is present in this locality, and that it reaccumulates here after it has been wiped away, does not indicate that it comes from the frontal sinus, for it may reach this locality from the antrum as well as from the frontal sinus. It is only when the space between the middle turbinal and the outer nasal wall is so large that capillary attraction between them is impossible, that the location of the secretion is of value in the differential diagnosis between the sinuses of the anterior group; for, under these circumstances, the secretion from the frontal sinus is apt to accumulate in the anterior part of the middle meatus, that from the antrum in the posterior part.

The secretion of the sphenoid sinus is apt to flow into the nasopharynx; but it usually flows, together with the secretion from the posterior ethmoid cells, over the middle turbinal into the olfactory fissure. The mere presence of secretion in this region, however, is not pathognomonic of diseases of the posterior group of cells. For the secretion from the anterior group, which is drawn by capillary attraction to the outer surface of the middle turbinal, may accumulate along the edge of this structure in the form of a hanging drop or band. The secretion is not limited, however, to this hanging drop or band alone; for upon closer examination it can be seen that a thin film of secretion extends upwards on both sides of the turbinal, having been drawn up into this position by virtue of its wetting power, i. e., by adhesion. The thin film corresponds to the meniscus in a hollow space or cavity. If, now, the middle turbinal is in contact with the septum, or near enough to it to enable the drop of secretion to bridge the gap, the secretion will be readily drawn up into the angular space between the two structures, according to the law of capillarity which has been quoted. The presence of secretion in this region is, therefore, pathognomic only when disease of the anterior group has been excluded, or when the secretion can be seen in the superior meatus by posterior rhinoscopy.

The secretion which flows from the hiatus semilunaris over the uncinate process reaches the inner surface of the lower turbinal, and may accumulate along its lower border and reach the septum in the same manner as described above for the middle turbinal. From both turbinals the secretion of the entire nose is carried over to the septum, along which it can easily flow down to the nasal floor, to be discharged from the nose.

Between the two turbinals and the septum there is a triangular space, around the edges of which secretion is held by capillary attraction; but in many individuals this space is filled up by a slight elevation, thickening or spur of the septum, which converts this triangular space into a space with parallel walls, so that capillary attraction is equalized over this area. Such a slight elevation of the septum in this region may, therefore, be an aid to drainage, and its removal a distinct detriment.

It is evident from the above facts that the nasal passages may be regarded as a series of capillary spaces, which are in direct communication with the sinuses through the natural orifices, and that the secretion which lies in these capillary spaces is in direct continuity with the secretion which lies within the sinuses. It therefore follows that when the secretion which has entered the nasal passages through one of the natural openings, has reached as far down as the level of the fluid within the sinus, a new factor in drainage is called into play, namely, syphonage; for under these conditions, the weight of the fluid within the sinus is balanced by the weight of the fluid in the nasal passages. As the capillarity of the nasal passages is exerted between the turbinals and the septum, its effects must be co-extensive with these structures. Hence, as the area of the septum is very great, both in height and in length, especially in comparison with the corresponding dimensions of any one of the sinuses, the nasal passages must be considered as the long arm of the syphon, which has several short arms, each represented by one of the sinuses. The fact that the combined area of the sinuses is much greater than that of the septum and nasal passages does not enter into consideration at all; for syphonage depends upon the relative pressure in its two arms, and is independent of the number of vessels which may feed the syphon. When the amount of secretion is normal, the effect of syphonage upon each sinus is the same as if the other sinuses did not exist. When, on the other hand, the amount of secretion in one sinus is excessive, the increased volume of fluid may choke the long arm of the syphon, i. e., the nasal passages, and interfere with the flow from the other sinuses. The secretion may even back up into another short arm of the syphon, i. e., into another sinus, and so we note the clinical fact that when one sinus is diseased the others are endangered. The position and shape of the natural orifices have no effect upon syphonage; for the natural orifice corresponds to the bend of the syphon, and it is quite immaterial whether it happens to be high or low, angular or rounded. Syphonage is independent of the position of the head; for the area of the septum is so great that it is equally effective in every position.

In order to maintain the efficiency of the syphon, it is necessary that the continuity of the fluid from within the sinus, through the natural orifice and into the nasal passage be unbroken. This continuity is favored by the tenacity of the secretion, which is supplied by its mucous constituents. A break in the continuity of the fluid, and a consequent interruption of the syphonage, may undoubtedly occur from various causes, but in the healthy nose such a break would be readily repaired by the activity of the cilia; for the direction of the ciliary movements corresponds exactly to the direction of the syphonage.

It has been supposed that ordinary quiet respiration aids the drainage of the sinuses by exerting a suction action during inspiration, the return of the fluid being prevented by a valve-like action of the semilunar hiatus. This theory would leave out of account entirely the posterior group of sinuses, as very little air passes through the superior meatus during quiet respiration.

It has also been supposed that expiration empties the sinuses in a way similar to the manner of emptying the middle ear by pollitzerization. That the ordinary movements of quiet respiration have no such effect may be proven by the observation that during quiet respiration a drop of mucus held in any of the capillary spaces of the nose, executes only a very slight to and fro movement. On the other hand, forced expiration, as in sneezing and blowing the nose, and forced inspiration, as in the act called sniffling, act very powerfully to clear the nose of accumulated secretion, and by keeping the long arm of the syphon clear, aid in maintaining proper drainage. In like manner swallowing, gagging and gargling, by causing a reflex contraction of the superior constrictor of the pharynx, help to keep the posterior nares and naso-pharynx clear of secretion.

Atmospheric conditions have a marked effect upon the state of the nasal mucous membrane, and hence exert a secondary influence upon the drainage of the sinuses. The inhalation of cold and dry air causes a swelling of the venous channels, both upon the turbinals, and upon the septum, thus narrowing the respiratory channels, in order to expand, warm and moisten the inspired air. Under these conditions the outlets of the sinuses may become obstructed, and so we find that cold weather favors the occurrence of acute sinus affections, as well as exacerbations of chronic affections. When the atmosphere is warm and contains the proper amount of moisture, this engorgement of the mucous membrane disappears. This physiological reaction of the turbinals to changes in the surrounding atmosphere is very prompt, and is effected through the agency of the vaso-motor nerves.

By accentuating the favorable conditions of the atmosphere, i. e., by making the inspired air excessively warm and excessively moist, as is the case when the individual is subjected to the inhalation of steam, this physiological action is intensified. Such inhalations may therefore be used therapeutically, for under their use swollen mucous membrane shrinks, the engorged turbinals contract, the capillary spaces are restored to their normal size, and the openings of the accessory sinuses are made patent. Their therapeutic value may be enhanced by adding to the boiling water one of the volatile oils or balsams, such as menthol, eucalyptus, or the compound tincture of benzoin. The vapor of these drugs, probably by stimulating the activity of the ciliary movements, starts the flow of the nasal syphon, and aids materially in draining the sinuses.

Steam inhalations should not be administered from any of the face steaming apparatuses or croup-kettles which are sold for this purpose, as the steam emerges from such an apparatus in a forcible jet, which carries with it a fine spray of hot water, which may scorch the face. They are best administered from a broad open vessel, such as an ordinary basin, set up over an alcohol lamp. The head and entire apparatus are covered with a towel or blanket. After a few minutes the face begins to perspire and a discharge from the nose occurs. Within ten minutes thereafter the full benefit of the inhalation is obtained.

The value of steam inhalations in acute accessory sinus disease has been known for a long time; their persistent and repeated use is also distinctly beneficial in the palliative treatment of those chronic affections which are associated with thickened secretion and crust formation. The writer wishes, however, to call especial attention to the hitherto unknown fact that such inhalations may be used for diagnostic purposes in a certain class of cases.

One of the most common symptoms of sinus disease is headache, which, in the chronic cases takes the form of recurrent neuralgia.

Such headaches are caused by a temporary occlusion of the natural orifice of the affected sinus, and can generally be quickly relieved by the use of steam. *When, therefore, a patient with a recurrent headache of long standing, whether nasal symptoms, such as discharge, etc., be manifest or not, is subjected to the action of a steam inhalation as above described, if the headache be relieved, even though the relief be only partial or temporary, it can be definitely stated that the cause of the headache will be found in one of the accessory sinuses of the nose, or in the neighborhood of their natural orifices.*

The fact that this procedure, which may be called a test for the nasal origin of headache, gives reliable information only when the result is positive, and that failure of the inhalation to relieve the headache does not necessarily exclude accessory sinus disease, does not invalidate the test; nor does the fact that it gives us no information as to which sinus is affected. The fact that the specialist has more accurate and more definite means of diagnosis renders it less useful to him than to the general practitioner, who is unprepared for, or unskilled in the more exact diagnosis of intranasal conditions. For the general practitioner, this test constitutes a simple and harmless procedure, which will enable him to determine the cause of many a persistent headache, which has long resisted his efforts at internal medication. And the fact that a headache which is caused by accessory sinus disease, can be cured by appropriate surgical treatment, is one of the triumphs of which the modern rhinologist may justly be proud.

These observations upon the drainage of the sinuses, which are the result of a study of the course of the secretions in patients convalescing from acute sinus disease, in private practice, and in a large variety of clinical material in the service of Dr. Emil Mayer at the Mount Sinai Hospital Dispensary, with whom I am associated, may be summarized as follows:

The drainage of the accessory sinuses is influenced by gravitation to a slight degree in certain positions of the head. It is chiefly effected by ciliary activity, by the power of the secretion of creeping over the surface of the mucous membrane, i. e., adhesion, by capillary attraction at the natural orifices of the sinuses, and by the syphonage exerted by the nasal passages. The combined action of these forces is favored by the respiratory air currents, and by certain atmospheric conditions.

By exaggerating the favorable atmospheric conditions, as in the use of steam inhalations, a valuable therapeutic agent is obtained, by means of which the drainage of the sinuses can be improved in diseased conditions, and which action is so pronounced that its effects may be used for diagnostic purposes in a general way in a certain class of cases.

616 Madison avenue.

Treatment of Innocent Laryngeal Growths by the Galvano-Cautery. A. WYLIE, *Lancet*, Nov. 23, 1907.

The advantages of the galvano-cautery are:

(1) That very minute growths can be obliterated and that, as far as experience shows, they do not return;

(2) That small vascular growths can be removed without the risk of haemorrhage.

(3) That it is far superior to chemical caustics; the dangers of local reaction arising from chromic and lactic acid are always considerable.

(4) That the technique is more reliable, more precise, and involves less risk of damage to adjacent structures.

(5) That the whole operation is in view of the surgeon, which is not the case with forceps.

(6) That by it small sessile growth on the mesial surface of the vocal cords are more thoroughly treated than by the forceps.

(7) That the stumps of growths already removed by other instruments can be obliterated by the cautery.

(8) The galvano-cautery cuts off the blood-supply and thus kills the growth, while the forceps often only removes the superficial parts; and

(9) That it diminishes the liability of local infectivity of papillomata.

THOMSON.

TOTAL DEAFNESS FOLLOWING INFECTIOUS DISEASES.

BY L. J. GOLDBACH, M. D., BALTIMORE, MD.

The disturbance of hearing or the absolute total deafness following as an after complication of the infectious diseases, occurs quite frequently. Meningitis, with its divisions of encephalitis and basilar-meningitis, seem to predominate; typhoid claims a goodly number, as well as diphtheria, parotiditis, hydrocephalus, syphilis, scarlet fever and measles.

It is true, in one sense of the word, the complications of labyrinthine deafness are not so numerous when comparison is made with other involvements following such maladies; nevertheless, when they do occur, the consequences are such that the sequela is usually total destruction to the organs of hearing. The cases occur usually in childhood, and the nerve deafness is bilateral. At times a case of unilateral nerve deafness may be seen; it is then commonly due to a parotiditis or scarlet fever, particularly parotiditis.

Infections of the organs of hearing may follow the train of a sporadic as well as an epidemic cerebro-spinal meningitis; or they may follow any meningeal complication affecting the middle or internal ear, bringing about total destruction to the organs of hearing, and consequently incurable deafness following. The pathological condition may go further and bring about deaf-mutism. Such occurs usually in childhood; yet there is no exemption for the adult. The sequelae of labyrinthine involvement leaves the diseased organs of hearing (the predilection seems to be for the auditory nerve), in an incurable state.

The pathological condition existing may be an exudate causing either a primary or secondary atrophy of the auditory nerve or its nucleus; or in the aqueductus cochlea or labyrinth; or a chemical change of the peri-lymph.

To bring forth this pathology, showing the destruction wrought and brought about by the diplococcus intra-cellularis meningitidis by the typhoid bacillus, by the Klebs-Loeffler bacillus and by the various forms of streptococci and the staphylococci, is a difficult proposition. Perhaps their attack is on the nerve fibers through the aqueductus cochleae or the labyrinth; or the weight of the infection may fall in particular on the endothelial covering of the labyrintheal cavity. How shall we decide, when it shows itself by the different intensities, through the severity of its infection? Do we have, in the severest forms, the necrotic falling off of the soft parts of the labyrinth, or a labyrintheal deafness, due partly to the direct influence of the toxin, thereby leaving a cellular and fibrinous deposit on the endothelium of the bony frame work, or the purulent exudate dwindling to a small collection and covering the space cavity in the labyrinth to a more or less degree?

Here is a subject open for some interesting investigation, and especially when literature on this matter is so scarce. It presents innumerable difficulties; the post-mortems are few, and when made it is hard to draw any satisfactory conclusions regarding the pathological condition existing.

The middle ear shares in the inflammatory and purulent condition by the infection penetrating the fenestral openings, causing a rupturing of the tympanic membrane and bringing about inflammatory adhesions with a secondary necrosis of the ossicles. This latter condition is usually brought about by a direct infection through the Eustachian tube, caused by the toxin of scarlet fever or measles.

Those conditions causing marked contraction and thickening of the tympanic membrane with adherent immoble ossicles are usually due to some catarrhal condition, a peculiar diathesis, or a family tendency. Those conditions strangely noted of marked deafness, without any marked otoscopical changes are due, in the majority of cases, to the after complications of meningitis, typhoid fever and hydrocephalus.

What then, in summing the pathological condition, takes place? Are the results of such inflammatory reaction:

First. A degenerative or intercellular change of the auditory nerve or on its sheath?

Second. A perverted chemical change in the peri-lymphatic spaces of the labyrinth partly destroying its membranous structure?

Third. A secondary inflammatory exudate near or on the floor of the fourth ventricle, leading to secondary atrophy of the auditory nuclei?

Fourth. A pathological condition of the blood taking place—a toxaemia.

Fifth. An inflammatory exudation of the meninges extending to the acoustic nerve?

Sixth. Why is not the facial nerve involved in such violent inflammatory conditions; especially when it is in such close proximity to the eighth nerve?

In the clinical cases reported below, the otoscopical appearances did not show anything of a marked or suspected pathological change except one and that was due to measles. The tympanic membranes appeared normal; ossicles freely movable, and a patency of the Eustachian tube existing. On testing hearing by means of a continous toned series of the tuning forks and Galton's whistle, there showed absolutely no aerial or bone conduction; neither for the higher or lower tuned forks.

The treatment for such cases seems nil; local treatment, by the various methods that are known to the otologists, as well as trying to educate the nerve to various notes of the scale, proved to no avail. On one of the patients, an ossiculectomy was performed; I have not noticed any improvement in the patient's hearing. The constitutional treatment of pilocarpin, strychnia, increasing doses of potassium iodide, and the various other drugs supposed to have beneficial action, proved negative as regards any desired results. The patients were placed in as healthy general condition as possible. The results were far from being satisfactory.

Mav we, when such conditions occur in childhood, partly trust to the regenerative powers of the young in bringing back at least to some extent, the hearing, which, before the infection had taken place, was very good? Nevertheless, when a mental picture is drawn of the destruction and pathological changes that have taken place, especially within an area, that as yet has not been benefitted by the surgeon's knife, we must, for the present, be cautious as regards our prognosis. The patients, at the best, remain in their lamentable and pitiable condition.

MENINGITIS CASES.

Case I. L. S., male, eight years. Family history negative. Two brothers, both living and in good health. No sisters. No organic diseases in family. No venereal diseases. Child had the usual diseases of childhood, with the exception of diphtheria. No after complications.

General condition of patient, as regards organs of digestion, respiration, circulation and urinary apparatus, good.

He had the attack of basilar-meningitis when seven years old. The attack was a severe one. Three days after the beginning there was an involvement of his speech. The attack lasted for four weeks; then patient gradually improved; the hearing and speech, however, did not. Now the child's general physical condition appears to be very good.

The child has absolutely no aerial or bone conduction. Otoscopical examination, negative.

Case II. M. S., girl, five years old. Family history, negative. One sister, healthy condition. Child had measles when one year old; no after complications. Pertussis when two years old.

March, 1907, had the attack of basilar meningitis. It was five weeks in duration. Second week of the disease, parent noticed the inability of child to hear. There is some involvement of her speech; the few words the child utters are very indistinct. At the present time I notice no improvement of the child. The general condition of patient appears to be very good. The otoscopical examination is negative.

TYPHOID FEVER.

Case III. C. B., aged twelve. Family history, negative. Five brothers and five sisters, all living and in good health. No organic diseases in family. No syphilis. During childhood had measles when eight years old. Pertussis, when nine years old. General condition of patient, as regards organs of digestion, respiration, circulation and kidneys, good.

His attack of typhoid began April 29, 1906; duration, five weeks. During the first week of his typhoid he was very delirious. Five days after his delirium, mother noticed child could not hear. The deafness came on at once; since then no improvement in the hearing has been noticed. Patient always suffered with headaches. The boy is the fifth child of eleven children. Otoscopical examination is negative.

Case IV. F. A., boy, fourteen years of age. Family history, negative. No diseases of childhood. His attack of typhoid lasted three weeks; during the second week his hearing became markedly involved. Now hearing is very poor; no aerial or bone conduction. Otoscopical examination, negative.

Case VI. Male, forty years of age. White, single. Family history, negative. Patient has Hutchinson's teeth. Had typhoid lasting five weeks; during the third week, he noticed his hearing becoming affected. The patient at present has a slight aerial conduction with the highest tuned forks. Otoscopical examination, negative. Before the typhoid his hearing was good. General condition of patient at the present time is very good.

HYDROCEPHALUS.

Case VII. Boy, aged ten. Family history, negative. No diseases of childhood. The patient's mother, being an ignorant foreigner, made it impossible to get any history whatever. Mother said, "the boy seems well, though his hearing—no good." He hears the Galton whistle. Otoscopical examination showed nothing; the boy's vision is good; no defect in speech.

MEASLES.

Case VIII. H. B., male, eighteen years of age. Family history, negative. No diseases of childhood, with the exception of measles, which he had when five years of age. No venereal disease. The patient said that his hearing was very good before he had measles.

Otoscopical examination reveals a markedly thickened and retracted tympanic membrane. He hears the fork 2,048 double vibrations. No defect of vision or speech.

ADDENDUM.

Since writing the above I have succeeded by means of deep intratympanic massage (suction with release), in enabling case VI to to hear fork 512 C^2 by bone and aerial conduction. Formerly he could not hear any fork. His hearing has improved very much —more than I would have dared expect.

2217 East Pratt street.

Bier's Hyperæmia. Special Application to Diseases of the Eye and Ear.

F. W. Miller (Los Angeles) *South. Calif. Practitioner*, April, 1908.

Miller observes that the greatest number of opinions of the method are, so far, from foreign sources, and that there has not been sufficient work done in this country to justify an estimate of its value. Several cases of mastoid reported cured were palpably ordinary, acute, purulent, otitis, with evidence of mastoid tenderness; not uncommon in children. The treatment is effective only in acute or subacute cases, and requires skill, and properly selected cases.

Eaton.

A CONSIDERATION OF THE INTRA-CRANIAL COMPLICATIONS OF SUPPURATIVE OTITIS MEDIA.*

BY J. J. THOMPSON, M. D., NEW YORK CITY.

Within the last few years a great deal has been written concerning the intracranial complications of middle ear suppurations, and our knowledge of these conditions has been greatly enriched, but at times they offer almost insurmountable difficulties, both as to diagnosis and treatment, and each case remains a law unto itself. There can be no doubt from the increased number of cases reported that cerebral infections are more frequently recognized, and more successfully dealt with than they were some ten years ago. Among the more common complications are meningitis, cerebral and cerebellar abscess, and jugular bulb and lateral sinus infections.

MENINGITIS may be divided into five general types, purulent lepto-meningitis, pachy-meningitis, serous, epidemic, and tubucular meningitis. The two latter do not usually follow in the wake of otitis media, or have it as a causal factor, although occasionally they may be associated with it, and offer difficulties in the way of diagnosis. Pachy-meningitis or inflammation of the dura, is not so serious in its consequences as the other forms, and as a separate condition must be rather rare, and after a short time, in the great majority of acute cases, merges into lepto-miningitis. This latter is the type with which otologists are principally concerned and, in fatal cases of ear disease, forms undoubtedly the most frequent cause of death. The cause is almost without exception an infection by some one of the pyogenic micro-organisms, by whatever route they gain entrance to the cranium. It follows chronic otitis much more frequently than the acute form of the disease, and is particularly liable to occur in an individual physically below par. A blow of sufficient severity is sometimes the exciting cause, either by opening a path of infection through a minute fracture of the tegmen tympani, or by rendering the meninges more susceptible on account of the accompanying congestion. More frequently the blood vessels or the lymphatics of the part are responsible for the transmission of the micro-organisms or they may find their way through dehiscences in the tympanic tegmen, or carious erosions of the bone in this location. I am inclined to think that when a meningitis develops during the course of a chronic suppuration, it is more frequently due to extension through the blood stream of lymph channels, than to direct contact of the membranes with infected material.

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*Candidates' thesis for admission to the American Laryngological. Rhinological and Otological Society. presented at the thirteenth annual meeting of the Society, New York City. May 30, 31, and June 1, 1907.

In cases of caries, where the tegmen of the middle ear or antrum is destroyed, brain abscess is liable to be a more frequent complication during the existence of which a meningitis may develop at any time from rupture, either on the surface or into a ventricle. This view is strengthened by the fact that at autopsy it has been in my experience rather rare to be able to trace direct continuity of the infection from the middle ear or exposed dura to the site of plastic exudate. This purulent or plastic material is very often found covering the entire base of the brain and extending even onto the other side along the Sylvian fissure, while the arachnoid at the site of exposure, if an operation has been performed, may be perfectly clear, or at the most slightly congested. In cases of this kind, it is not unlikely that the sheaths of the facial and auditory nerves, and the labyrinth itself offer a tract along which bacteria may travel.

Among the causes of meningitis must be mentioned the trauma occasioned by operations upon the mastoid. Possibly 20 per cent of all the fatal cases are the result, or at least follow these operations. The statistics upon this point brought out by Dr. Harris at the Boston meeting of the American Laryngological, Rhinological and Otological Society are rather startling. He stated that out of eighty-three radical operations performed at the Manhattan Eye and Ear Hospital, ten were followed by a fatal meningitis. This certainly is a subject that deserves serious consideration, and one is at a loss whether to construe it as an argument in favor of radical operation, only performed at an earlier date than we are accustomed to do it, or an indication of the great danger attending it. Out of a limited number of radical operations coming under my care during the past six months, two have been followed by meningitis, and one by cerebral abscess, all resulting fatally. In each case, the operation was undertaken solely for the cure of chronic suppuration in the tympanum, and in subjects that were apparently healthy, and had shown no indications of any intracranial lesions prior to their admittance to the hospital. It seems to make very little difference in the subsequent developments, whether the dura is exposed at the time of operation or not. In fact, in each of the cases, mentioned above, the dura was not uncovered until after the alarming symptoms had manifested themselves. Whatever the explanation may be, it is certain that operative interference in a great many instances is the exciting cause of meningitis. It may be due to the open condition of the blood vessels in the region, or the accidental forcing of infection into the labyrinth during our manipulations within the middle ear, or to starting into activity a focus that has for some time been present but in a quiescent state.

The symptoms of meningitis are probably more pronounced than those of any of the other complications. Severe and persistent headache, associated at first with restlessness, and later with stupor, is always exceedingly suspicious, especially if accompanied by a sharp rise in the temperature. The headache may be localized in the frontal region at the beginning of the attack, but usually before long becomes more general, and is often most severe over the occiput. It is of greater severity than that found in abscess, and in children, or even in adults will cause them to call out continually. There is almost always a considerable increase in the rapidity of the pulse, and a moderate elevation of the temperature. This may reach as high as 105 degrees, and is not subject to any marked remissions. There may or may not be vomiting, more frequently it is absent. The eye symptoms do not usually develop until late in the disease, and are usually an indication that the base has become involved. There may then be a descending optic neuritis, and it is of a more inflammatory type than the choked disc that is seen as a result of increased intracranial pressure. Paralysis of the extra-ocular muscles is sometimes present from involvement of the nerves at the base of the brain. The pupils in the early stages are contracted, but with onset of coma they become widely dilated. One of the most valuable symptoms is a marked rigidity and contraction of the muscles of the neck, and except in the epidemic variety, it is a fair indication of a fatal termination. A similar contraction of the abdominal muscles is seen occasionally. The reflexes may be increased, and Kernig's sign may be elicited. Constipation is the rule at the beginning, but later the patient loses control of both bowels and bladder. Muscular twitching is often present, and may be confined to one limb or one group of muscles, or it may be general, involving all the limbs and the facial muscles as well. Nearing the end the pulse becomes very rapid and irregular, and the temperature may reach 106 degrees or higher.

These are some of the symptoms of the severe and typical cases, but we more frequently have only a few of them present, and it is then more difficult to make a correct diagnosis. There may be little more than severe pain, and elevation of pulse rate and temperature, a condition common to a great many general diseases.

I had a case recently, which two months after a mastoid operation suddenly developed a temperature of 104 degrees, and a corresponding increase in the pulse rate, accompanied by most intense pain in the head. No other symptoms were present except that there was occasional delirium. Taking into consideration the fact of a recent mastoid operation, the first diagnosis was meningitis, but within twenty-four hours, while the pain in the head markedly diminished, the mentality likewise improved. This had not been my previous experience in meningitis cases, the pain usually subsiding with the onset of stupor. On this account I was suspicious of some general disease, and had a blood count and Widal test made. The leucocytes only numbered a little over 4,000 per cubic millimeter, but the first Widal test was negative. A second one showed clumping beautifully, and the case ran the usual course of typhoid fever. Shortly afterward a case showing almost identical symptoms, except that the severity of the head pain did not lessen until the onset of stupor, died of meningitis which involved the entire base of the brain. Types of this kind are sometimes most difficult to diagnose in the early stages. Since the employment of lumbar puncture has become more general, and the interpretation of its findings has become better understood, it offers valuable aid. If definite abnormalities are found, they are almost positive evidence of changes in the meninges; but, on the other hand, their absence does not necessarily mean that there is no lesion of the meningeal coverings; in other words, positive findings are of the greatest value, but we must not be led into the error of considering that because the fluid is apparently normal in every respect, we are dealing with a condition other than meningitis. Some claim to be able to differentiate the various forms of meningitis by the microscopical examination of the fluid. Basing their opinions on the specific gravity, and the number of leucocytes and other fixed elements found, together with the bacteriological findings. Tubercular bacilli, streptococci, staphylococci, and pneumococci are the micro-organisms generally found.

From a practical standpoint, however, the greatest value is generally placed on the force with which the fluid flows when the puncture is made, and the microscopical appearance which it presents, relying on the general history and other clinical records to determine the particular form of meningitis with which we are dealing. In the majority of cases the fluid will issue with sufficient force to demonstrate that it is retained under pressure, and in meningitis of more than a few hours duration it should be cloudy in appearance, instead of clear as it normally is. The presence of any of the above enumerated micro-organisms of course is additional proof that the meninges are affected, but it is always possible that this invasion is not primary, but due to the rupture of an old abscess, that has failed to show itself by symptoms. The blood count is not so characteristic, as in sinus thrombosis, or abscess, and depends somewhat on the severity of the infection, and the degree of absorption.

An opalescent turbidity of the withdrawn fluid is regarded by Schwartze as positive diagnostic evidence of tubercular-meningitis, but without the presence of tubercular bacilli, too much dependence cannot be placed upon it.

The meningitis of children offers the greatest difficulty in differentiation. It is in childhood that tubercular-meningitis is most frequent, and is found in its most characteristic form, whether complicating a chronic otorrhea or existing independently of it, but it does occur rarely in adults. A case of unusual interest came under my care during the past summer. The patient was a young man, twenty-two years of age, who came from the country for the purpose of having a radical operation for the cure of an otorrhea that had persisted in spite of treatment for several years. During that time he had not shown any indications of intra-cranial trouble, and none was suspected when the operation was undertaken. On uncovering the dura over the tegmen antri, it presented an unusual appearance. It did not show the usual tenseness and elasticity, and was covered with the most minute white spots, each one being smaller than the head of a pin. Without knowing anything about the history of the young man, I remarked at the time, that although I had never seen a case like it, the spots resembled very closely military tubercles. I made a small opening in the dura, and on inserting a probe, it seemed to drop into a cavity about the size of a cherry, but nothing was evacuated from it. I enlarged the opening and packed the cavity with gauze. At the first dressing, the opening in the dura, which three days previously had been only a slit, was now the size of a silver quarter, the membrane having undergone complete destruction to that extent, and considerable necrotic cerebral tissue could be wiped from the walls of the cavity. There was only a slight elevation of temperature for a few days, and the patient progressed so favorably that he was discharged from the hospital. At the end of about four weeks he presented himself suffering from intense headache, his temperature was 103 degrees, and he showed all the symptoms of a beginning meningitis, or an extension of pus formations in the cranium. Owing to the tendency of brain abscesses to form new pockets, the latter was suspected, and the surrounding brain tissue was thoroughly explored without finding anything of that nature. The patient died three days later, and autopsy showed a large plastic exudate at the cerebral base. I learned afterward from the family physician, that a brother of the young man had died a year or two previously of tuberculosis, and I have always thought that the peculiar appearance of the dura observed at the time of the operation was due to tuberculosis, and that the lepto-meningitis from which he died was similar in nature.

After mastoid operations we occasionally have a few days in which the temperature is elevated, the patient is extremely restless, the pulse is rapid, and a general condition of irritability exists, that I think can in many cases be accounted for by a condition of meningeal irritation not reaching to the extent of actual inflammation on account of the absence of infection. This does not seem at all improbable when we consider the indirect traumatism that the meninges are subject to from the use of the mallet, and often from exposure during the course of the operation. This, of course, is not serious, and entirely disappears in a few days. On the other hand, the prognosis in the ordinary form of lepto-meningitis is extremely grave, in fact, a good many observers go as far as to say that recovery is impossible, and that where death is not the result, there has been an error in diagnosis. While I am not convinced that this is true, no doubt the percentage of recoveries is very small indeed, and in successful cases it seems that there must be some other cause for the recovery than the beneficial effects of any particular form of treatment employed.

In regard to the treatment, very little can be done beyond keeping the patient as quiet as possible, and applying an ice coil to the head, together with free catharsis. There are no drugs that have any appreciable effect. Recently some good results have been reported from the use of lumbar puncture, but beyond relieving the pressure, and in this way ameliorating the symptoms, it is hard to see how it can have very much beneficial influence. It is claimed that by removing a certain amount of the fluid, its place is rapidly taken by a new supply that has some bactericidal action, and in this way the infection is overcome, but it has not been satisfactorily proven that this does actually occur. The introduction of remedial agents at the site of puncture is of no value in the type of meningitis met with as the result of middle ear suppuration, though it may be valuable in cerebro-spinal meningitis. Another measure that has been advocated is ventricular puncture, and the withdrawal of the spinal fluid in this way. I saw one case in which this was tried and the child recovered. Shortly afterward I saw it tried in another case and the patient died in three hours. I am sure that the effort to introduce a needle into the ventricle hastened the end, although a fatal termination seemed inevitable anyway. At the autopsy on the last case mentioned the ventricle was found entirely filled with clot, and the needle punctures were each surrounded by extravasated blood.

The most rational procedure where a diagnosis of meningitis has been made is to afford the best possible drainage at the site of infection if possible. If no operation has been done, the dura over the tegmen of the antrum and tympanum should be exposed, and sufficient of its bony covering removed to allow of the best possible drainage. If the meningitis follows an operation on the mastoid, the same holds good and sufficient bone should be removed to expose a large surrounding area of macroscopically healthy dura. Even with the greatest care this rarely has any effect upon the ultimate outcome of the case, for as previously stated, the extension to the base of the brain does not usually occur by direct continuity along the arachnoid, but through the lymphatics or blood stream.

ABSCESS.—In speaking of intra-cranial abscess of otitic origin, we can practically eliminate all abscesses except those occurring in the tempero-sphenoidal lobe, and in the cerebellum, on account of the proximity of these parts to the ear. While it is perfectly possible for an abscess to develop in a remote part of the brain as a result of suppuration in the middle ear it is comparatively rare, and the infection is much more likely to occur from the local destruction of bone, and the contact of the brain tissues with infected material, than from the transmission of micro-organisms through the blood stream, as I have stated frequently occurs in meningitis. For this same reason lesions in the tympanum and in the antrum are likely to produce abscess formation in the temporo-sphenoidal lobe, while those in the lateral sinus and in the labyrinth give pus pockets in the cerebellum. They occur most frequently between the ages of ten and thirty and next between thirty-five and fifty. They are rare before the age of ten, and are not often found in very old subjects. The detection of intracranial abscess is a matter of great difficulty and importance, from the fact that about forty per cent of cases diagnosed early make a good recovery, and it has been estimated that in Germany about 12,000 cases occur annually.

They are difficult to diagnose because they show fewer typical symptoms than any of the other intra-cranial complications of otitic origin, and they may remain in a quiescent state as far as symptoms are concerned for a long time. When manifestations are present, they are often so vague, and variable as not to draw attention to the true condition, until a great deal of destruction has been produced. Post mortems occasionally show large accumulations that have given rise to absolutely no symptoms and have been overlooked. This is particularly true of collections in the temporo-sphenoidal lobe on the right side. In the early diagnosis most careful attention must be paid to the general aspect of the case, and the manner and temperament of the patient. Friends should be carefully questioned regarding recent changes in the disposition, and personal habits, etc. A person possessed of an amiable disposition will occasionally become surly, and forgetful of personal cleanliness, and changed in his entire bearing toward his friends and relatives, without having actual hallucinations or delusions. The memory may become deficient, and dull headache, especially on exhaustion, is among one of the earliest symptoms, in fact, in the presence of a chronic aural discharge, one should always be suspicious of a headache that does not yield to ordinary measures. The headache may be localized to the side of the lesion, but this is by no means always the case, as an abscess in the temporal region is quite as likely to produce a frontal headache as one confined to the side of the head. Variation in the amount of discharge is sometimes noticed. There may be periods of marked exacerbation followed by complete cessation, indicating that a cavity larger than the mastoid antrum allows of its accumulation. Little is to be learned from the temperature. It is not usually elevated to any extent, in fact, a low temperature with other signs of absorption is considered one of the best symptoms of abscess formation, in contradistinction to sinus involvement and meningitis. On the other hand the temperature may be elevated, so that it is of very slight value in making a diagnosis. A slow pulse is of greater significance, and is much more likely to be present in abscess than in any other condition occurring as a result of middle ear suppuration. It may fall to 60 or lower, and if accompanied by a rise of temperature is very significant, although many adults have a pulse of 60 in perfect health. Percussion over the site of the abscess is all times accompanied by pain and a sensation different from that in other parts of the cranium is experienced by the patient. Among the symptoms found in a later stage may be mentioned mental inefficiency and inability to concentrate. In abscess occurring on the left side aphasia is one of the most valuable symptoms. The patient while perfectly aware of the name of any article and familiar with its uses is unable by any effort to pronounce its name. This is almost a typical symptom, and I have seen it present in several cases, and have noted it reported in many others. I have seen it also in one case of right sided abscess but am unable to recall whether or not the patient was left-handed.

During the past summer I had the opportunity of seeing a young man suffering from an abscess of traumatic origin in the lower portion of the ascending parietal and ascending frontal convolutions, in which the destruction of the brain was very extensive. Some time previously a piece of coal had been driven into the cranial cavity, and the abscess developed as a result. He showed a rather peculiar symptom during the time that the pus collection was under pressure. In conversation he always used the third person instead of the first in referring to himself. His name was Edward, and instead of saying, "I want a drink of water," he would say, "Edward wants a drink of water." If asked how he felt, he would say, "Edward feels better to-day," and so on through his entire conversation. One peculiar sentence that I remember him saying was, "Edward's nurse is good to Edward." After the abscess cavity had been opened; and the necrotic tissue, as well as the collected pus had been removed, he reverted to the ordinary type of conversation, and always used the first person where it was properly required. After making a favorable advance for several weeks he finally died from basilar meningitis, but at no time returned to the use of the third person in place of the first, in the course of his conversation. During the treatment of this case I happened upon a procedure that I have not been able to find mentioned in the literature, and in this particular instance was of the greatest value, namely—compression of the jugular veins for the purpose of extruding the necrotic brain tissue. After incising the abscess and obtaining a small flow of pus, the dura and surrounding brain seemed to be in a collapsed condition, and even the introduction of a large curette failed to bring out any more pus. I did not have an encephaloscope with me, so after waiting for a few moments for the voluntary flow of any more necrotic tissue, I forcibly compressed both jugular veins in the neck, and after the lapse of a few seconds, representing the time requireed for sufficient increase in the intra-cranial pressure, I was amazed to see at least two ounces of pus and necrotic debris flow from the wound. For the sake of noticing the effect, several times I released my hold on the neck, when the flow would immediately cease, the brain tissue collapse, and any pus visible in the wound would be drawn back into the cavity within the brain. With the resumption of the pressure the flow of pus again commenced, each successive time requiring a longer period of pressure than the previous one, until finally nothing but what appeared to be blood came from the wound. It struck me at the time, and I have had reason to think so since, that this would be a useful procedure in all cases of abscess formation, for we are all familiar with the tendence of these pus accumulations in the cerebrum to burrow and form subsidary pockets, which it is at times impossible to detect until they are of sufficient size to erode their way into the parent cavity, or to produce symptoms from their pressure. Not only that, but I have often seen during autopsy, an abscess that in spite of repeated exploratory punctures into the temporo-sphenoidal lobe had not been struck, and which in some instances had only been missed by a few lines. It seems to me that in some of these cases, if the intra-cranial pressure were sufficiently increased, the pus might find its way to the nearest incision. With the exception of cases suffering from degenerative changes in the arterial system, I do not see how any damage could be done by this increase of pressure. Where it is of greatest value is in the treatment of cases in which an abscess has already been evacuated. At each dressing, the cavity can in this way be cleansed with less injury to normal brain tissue than by mopping the cavity with gauze, and with no more injury than where irrigation is used, with the additional advantage as before stated of evacuating connecting pockets.

To return to the symptomatology of cerebral abscess, vomiting is a valuable and frequent, though not constant symptom. The vomiting is usually of the projectile type, and occurs independently of the injection of food. The eyes sometimes offer vaulable evidence of this condition, the pupils may be unequal, most frequently showing dilation on the side of the lesion, and they may be inactive to light and accommodation. An optic neuritis occurs in about fifty per cent of cerebral abscesses according to some authorities, but in the cases I have seen, it has not been present as frequently as that, and must be classed among the later symptoms. It occurs with much greater frequency in cerebellar lesions, and in tumors than in abscess of the cerebrum. This may be accounted for by the fact that in a good many instances the optic neuritis is an indication of pressure, and abscess formation being a destructive lesion has not the same tendency to increase the pressure as a tumor, which consists essentially in the formation of new elements. Extraocular palsies are not often found owing to the location of the lesion, and when they do occur they are the result of pressure exerted on the nerves emerging at the base of the brain, rather from direct involvement of the nuclei themselves. If rupture of the abscess should occur, either on the surface or into a ventricle, the symptoms assume a sudden and grave character, muscular twitching, wide dilation of the pupils, involuntary passage of urine and feces, being among those most commonly found. The blood count is of considerable value in determining whether or not pus is accumulating within the cranium. The total number of leucocytes will almost invariably be increased, possibly to 16,000 or 18,000, with a relative increase in the number of polymorphonuclear neutrophiles. I am of the opinion however, that it is a mistake to place too much dependence on the blood count in making a diagnosis, and while it may be a valuable aid, and undoubtedly is, in a great many instances it is liable to be misleading. To satisfy myself of this fact, I had a blood count made in a series of cases of simple mastoiditis, showing no signs of intra-cranial complication, and in a considerable number found that with a total increase of the leucocytes as high as 22,000, and in one instance a polymorphonuclear percentage of 85, nothing developed after the ordinary mastoid operation had been performed. Therefore, while the blood count is a valuable adjunct to the clinical symptoms, we should not consider that every individual showing a pronounced deviation from the normal is necessarily the subject of an intra-cranial lesion.

The examination of the cerebro-spinal fluid has not the same significance in cerebral abscess as it has in meningitis. Dr. F. L. Jack, of Boston, states that in cases of his he has found the fluid cloudy in abscess formation as well as in meningitis, and I have often wondered what is the condition of the fluid in all febrile conditions. I have not seen the report of any work done along this line, and it has frequently occurred to me that the spinal fluid may show an increase in its albuminous constituents during the course of a high fever, whatever may be its origin, just as the urine does. A clear fluid expelled under excessive pressure argues to a certain extent the presence of an abscess or tumor, as this will more readily account for an increased pressure without change in the constitution of the fluid, than any other intra-cranial condition. No satisfactory results have ever been obtained from the use of X-Rays in localizing cerebral or cerebellum abscesses.

Localizing symptoms of cerebral abscess, that is the various muscular paralyses, are not often encountered, and when they are present, are invariably a late manifestation. They are always hemiplegic in type, and may be slight or extensive, and when present offer the best means of estimating the exact location of the lesion. An abscess invading the motor area, or making pressure upon it, will give a paralysis of the opposite side, involving the arm more frequently than the leg, and when the lesion exists on the left side aphasia is generally an associated condition.

These may be considered the more important of the objective and subjective symptoms of cerebral abscess, that are apparent before the exposure of the brain coverings, but there remain to be discussed the various signs that are present when the bony covering having been removed, a portion of the intra-cranial contents is exposed to view. In some instances the appearance of the dura cannot be mistaken. It may show a discolored and bulging surface, or even a fistulous tract through which pus or purulent fluid is escaping; but, on the other hand, in deep-seated accumulations it may not differ in the least from the normal. The presence or absence of pulsation is not of any particular significance, being absent it seems to me, in the great majority of cases where the intra-cranial contents are healthy. The presence of granulations on the dura does not point to any lesion beneath it, and is nature's most effective barrier against contamination of its contents. A healthy appearance of the dura, in the presence of clinical symptoms pointing to brain abscess, should not deter us from a thorough exploration of the brain, for it is a fact well known that it is not common to find accumulations of pus immediately beneath this membrane, and that in the great majority of cases they are situated at some distance from the surface.

An abscess of any considerable size situated within the cerebellum is more likely to manifest itself by definite symptoms than is one in the cerebrum. The headache is generally most severe at the occiput, and rigidity of the neck muscles is often present. Optic neuritis is an early symptom, the characteristic cerebellar gait or titubation is rarely lacking, and other symptoms of muscular incoordination will usually be found if carefully sought. Paralysis of the cranial nerves due to pressure on the motor tracts in the cerebral crura are among the best diagnostic signs of cerebellar abscess. These show themselves with greatest regularity in the external recti muscles of the eyes supplied by the sixth nerve, and in the muscles of the tongue supplied by the hypoglossal. A weakness of one or both external recti muscles not amounting to paralysis, and not of sufficient severity to produce internal strabismus, is seen early in cerebellar abscess. Nystagmus, elicited on extreme lateral rotation of the eyes, is also to be looked for, as well as an area of sensory anaesthesia. The gait in cerebellar disease is staggering, closely resembling the movements of one who is intoxicated, motion usually tending to the side of the lesion, although this is not constant. It does not in any way resemble that of locomotor ataxia, and cannot well be mistaken for it. In one case that I saw recently after the patient was unable to move forward, he could make considerable progress backward, and in a direction opposite to the side on which the lesion was situated. Motor paralysis on the side opposite to the lesion is not uncommon from pressure on the crura cerebri of the same side, and various phenomena resulting from damning back of the cerebrospinal fluid, and interference with the circulation in the veins of Galen may manifest themselves.

The prognosis in cases of cerebellar abscess is not so good as in those occurring in the cerebrum. Notwithstanding the results reported by Horsley, the surgical efforts exerted in this country have not been crowned with the same success, and a large majority of the cases of this class end fatally.

The treatment of both cerebral and cerebellar abscess is entirely surgical, and any discussion of this phase of my topic must concern merely the best means of attacking these conditions, and their subsequent treatment after evacuation. In regard to the surgical procedure in cases of pus collections in the tempero-sphenoidal lobe, I think they should be divided into two classes, the first class consisting of those cases in which we are certain of the presence of such a condition, and also have definite ideas regarding its location; and the second class including those in which the presence of an abscess is only conjectured, or in which one is discovered at the time of a mastoid operation, and also those where from any cause one is believed to be present subsequent to the evisceration of the mastoid and middle ear. The latter class is by far the larger.

Where an abscess has been definitely located, it is the best surgery to attack it through an opening in the skull over the site, as this will allow of better inspection and more thorough evacuation than where a mastoid operation is first performed and the abscess opened through the dura above the roof of the antrum. On the other hand, where we already have the mastoid opened and are not sure, even of the presence of an abscess, and much less so of its location, on account of the absence of localizing symptoms, I am not sure that it is the wisest course. I know that it is generally advocated, the claim being made that a more sterile field is thus obtained; but in view of the large number of successful cases that are reported by a great many different operators, in which drainage has been maintained only through an opening into the mastoid wound, I am not convinced that this is not almost as good a procedure as to open the skull above the temporal ridge. It seems to me that for instance, where a radical operation has been performed, and all evidence of necrosis removed, and where the cavity is thoroughly flushed with antiseptic solutions, the wound is almost if not entirely as aseptic as one made through the hairy scalp, no matter how thoroughly it may be prepared. In addition, it seems to me that better drainage is obtained through an opening in this position than through one in any other region. It is the most dependent part, and in the majority of cases the abscess is liable to be situated nearer the surface here than any place else, and the mastoid wound may be kept open a long time with greater ease than one that has been made through the scalp. If, after exploring the brain, we find we have been mistaken in our diagnosis, as occurred to me recently, we have not subjected the patient to an additional loss of the bony covering of the cranial contents, and taking all things into consideration, if we are not sure of the location of the abscess we seek, I think the exploration may be undertaken with propriety through the dura above the roof of the antrum. An exploring needle, unless of large size, is not much use for this purpose because, unless provided with an obsturator, the soft brain tissues will fill its lumen before the cavity is entered, if one exists. A long-bladed scapel is better adapted to this purpose and the temporo-sphenoidal lobe should be punctured in all directions. It is preferable to make a number of small punctures in the dura rather than one long slit, prior to the discovery of pus, as cerebral hernia is not so liable to follow. If an abscess is disclosed, the dura should then be thoroughly opened and all necrotic contents removed, and its walls inspected with an encephaloscope, with a view of finding any communicating pockets that may exist. A large sized rubber drainage tube should be inserted, and the ordinary dressings applied. In most cases a rubber tube offers better drainage than gauze, allowing the intra-cranial pressure to force the newly formed contents of the cavity through its lumen, where gauze, in many instances, would act as a plug, and prevent their escape. At the subsequent dressings the cavity may be flushed with saline solution, and as I have stated before, I think it is a valuable procedure to moderately increase the intra-cranial pressure by compressing the jugular veins, in that way forcing out any broken down brain tissue that may have a tendency to remain behind. We should always be on the lookout for the formation of new collections, and open them as soon as they are found. Sufficient pressure of an even character must be maintained to prevent the formation of hernia.

Lateral Sinus Infections: Of all the sequelae of otitis media, lateral sinus thrombosis presents the most characteristic symptomatology, and offers by far the most favorable prognosis. If diagnosed early, and in the majority of cases this is not difficult, it may be attacked with reasonable assurance of success, unless complicated with abscess extension or meningitis. There are many ways in which infection of the sinus may occur. It may be due to the direct contact of the sinus with infective material in the mastoid cells, or even in the mastoid antrum when the sinus is situated abnormally far forward, or infection may be carried by its minute tributaries that drain the middle ear and mastoid process.

It is with rare exceptions secondary to mastoiditis and is always attacked through the mastoid process. No particular organism is especially prone to produce this condition, except as it may influence the extent and virulency of the mastoid involvement. When it occurs independent of mastoiditis, the lesion is usually located in the jugular bulb, thrombosis being produced by infection through the floor of the middle ear. This is more frequent in children, and this fact is accounted for by the occasional presence of bony dehiscences, or an unusually high dome for the reception of the sinus bulb.

Although it usually shows a group of unmistakable symptoms, at times these are not present, and it is not until upon uncovering the sinus that we are led to open it by the appearance of the vein itself. In a measure its symptoms are passive as compared with those of meningitis and brain abscess, if such a term may be used. There is rarely any great amount of pain or headache, the patient does not complain much, but is drowsy and may have a tendency to sleep the greater part of the time. Upon arousing him he will generally answer questions in an intelligent manner, but will lapse again as soon as conversation is discontinued. Often there is an initial chill followed by others. The temperature is the most characteristic symptom, showing an evening rise of as high as 106 degrees, in many cases only to drop to normal in the morning. This is not an invariable fact, however, for I had a case during the past summer in which the temperature did not fall below 105 degrees at any time from the first chill until its fatal termination.

The temperature may not be so high as in that case, but range between 102 degrees and 104 degrees, with slight diurnal remissions; likewise instead of one distinct chill there may be several periods during which chilly sensations are felt. The sharpness with which these two symptoms are marked depends upon the amount of septic material entering the system. If large quantities are being rapidly absorbed, the temperature during the rise will be very high, and the remissions pronounced, while if absorption is moderate in amount and slow, the variations will be slight, and the highest temperature record may not be above 103 degrees. The pulse rate is increased in proportion to the height of the temperature, and in severe cases will often reach 170 and higher. Oedema over the mastoid, and particularly over the region of exit of the mastoid vein is a valuable sign and should invariably be sought when sinus thrombosis is suspected, being due to blocking of the circulation in the neighborhood. Likewise if the clot extends to the cavernous sinus, oedema may be present in the eyelid of the same side and congestion of the ocular conjunctiva may accompany it. Choked disc is sometimes produced by the damming back of the return circulation through the ophthalmic vein. One of my successful cases showed this condition together with retinal hemorrhages for some time after the operation, but it eventually cleared up without leaving any impairment of the vision. Vertigo and vomiting are variable symptoms, and in the cases that I have seen have not been present to any extent. If the condition has existed for any time the patient shows all the symptoms of profound septic intoxication. The complexion is livid, the expression is anxious, and the tongue coated, etc. This evidence of absorption is about one of the most valuable aids in making a diagnosis. If other sources can be eliminated in the presence of an otorrhea, the sinus is the most likely source from which the supply of septic material is derived. The blood count is of greater value in this than in any of the other intra-cranial complications, merely inasmuch as it is an index of the degree to which the system is influenced by the toxaemia. The percentage of polymorphonuclear neutrophiles is of much greater importance in determining the prognosis, than the total number of leucocytes. In a case of any severity they will usually reach 18,000, and the percentage of polymorphonuclear cells will be over 80, and occasionally as high as 90.

A valuable sign, but one requiring a delicate technic, is the finding of bacteria in the blood stream. If this can be accomplished it offers almost positive evidence of thrombosis in the sinus, or jugular bulb, provided other sources of entrance can be eliminated beyond a reasonable doubt. However, the greatest care to prevent outside contamination is required, and the technic is so difficult and troublesome, and calls for such elaborate paraphernalia, that for ordinary clinical use it is not much used. Occasionally rigidity of the neck is noted, but the cordlike feel that is described as following the course of the vein, I have never been able to positively make out. In children, if the diagnosis has been delayed, the cervicle glands may enlarge rapidly, and even suppurate. I had a case this summer in which the cervicle glands formed a bunch as large as a hen's egg, and in which they were completely broken down.

The treatment of this condition has been the subject of extensive discussion during the past few years, and still there is no unanimity of opinion as to just what is the best course to pursue. One must be guided by the circumstances, and the conditions encountered in each particular case, and there is probably no other condition in otological surgery that requires such fine judgment in deciding the best course to follow. No set rule can be formulated to fit every case, and what will prove successful in one instance will be fatal in another, but one thing that applies to all cases, at all times, is the greatest conservatism with regard to the time spent in operating. With the possible exception of diabetics, speed seems to be of more importance in cases of sinus thrombosis, than in any others on which we are called to operate. Some operators claim that it is best to ligate the jugular vein before attempting to curette the jugular bulb, in all instances in which the clot extends that far, while others of equal skill maintain that this is not necessary except in the most extensive cases. From an experience as limited as mine has been, it is not possible to form any conclusions of value, except to the extent that they draw attention to the points made by other operators. In a fair proportion of cases we may not suspect sinus involvement until after the vessel has been uncovered, either accidentally or intentionally, and we are sometimes very much in doubt as to the necessity of opening it for investigation. I am firmly of the opinion that no one can be positive of the condition existing in the interior of a sinus until after it has been opened and inspected, and if carefully done this will not add any to the gravity of the operation, but many times will reveal conditions of the greatest importance. Whenever there is the slightest doubt the safest course is to open the sinus wall. Puncture with a needle is not of the least value, but on the contrary is very misleading, for with a peripheral clot, or one existing below or above the site of puncture, fluid blood may flow into the needle. The normal sinus has a somewhat characteristic blue appearance, while one containing a thrombus will often present a paler color. Pulsation is not a guide, nor can much be learned from palpation, because a mural clot can not be detected by the finger, nor will it interfere with the pulsation in the sinus. Dimpling is a more valuable sign, as it usually occurs in sinuses that are almost completely obstructed. All cases are not difficult to diagnose, a great many showing signs that cannot be mistaken, such as solidity of the vessel and marked discoloration, but in a large proportion of cases that have shown undoubted symptoms of thrombosis, the sinus on exposure will show no indications of involvement. In such cases it is advisable to open the sinus before proceeding to a jugular resection. Just in what cases it is advisable to do a jugular resection before opening the sinus, is not easy to determine, and is the source of some differences of opinion.

The scope of this paper will not permit of a full résumé of this phase of sinus thrombosis, but I will endeavor in a few words to state what to me seems a rational procedure. In studying the statistics of the subject, we must consider that they are liable to be very much in favor of primary resection, because in a great many cases where this is done and the outcome is favorable, it is possible that the same result might have been obtained with more simple methods, while in the fatal cases in which the resection has not been done, the outcome might not have been altered by that operation.

If we are sure that a clot extends into the bulb or beyond it, it is better to resect the vein before dealing with the sinus, but these cases form the minority of those coming under observation. Where we are not sure of this, it is better to deal with the sinus first in the hope that the neck operation may be avoided. If the clot can be definitely located in the upper portion of the verticle limb of the sinus, a gauze plug should be placed across the sinus as low as possible and well below the cardiac end of the thrombus, and the vessel wall slit up with a pair of scissors, until the upper end of the clot is passed and free bleeding occurs from the torcular end. The ontents should then be removed as well as the entire outer wall of the sinus. Care must be taken in doing this not to puncture the inner wall, and in this way infect the endocranial lymph space. If necessary, more bone must be removed and the sinus followed toward the torcula, until such free bleeding is obtained as to render us reasonably sure that the torcular limit of the thrombus has been passed, and inspection of the lumen of the vessel has verified it. We cannot often demarcate a clot so accurately as to be sure that its lower portion does not extend so low that we are unable to insert a plug below its bulbar end, and in such cases it is better to open the sinus before making any pressure in this region, for fear particles may be dislodged and forced into the jugular vein. In order to do this, we should have two plugs in readiness, and then make a free slit in the sinus. If bleeding occurs freely, a compression plug should be placed on the torcular side of our incision, and if hemorrhage now ceases, we know the clot exists toward the bulb. If we believe it does not extend to the bulb. while the assistant makes pressure over the jugular, the thrombus may be curetted from the sinus and the wall slit further in this direction, after which pressure is made to control the bleeding when free return flow is obtained. If on compressing the torcular end we still have a rapid flow of blood from the sinus, we conclude that the thrombus is situated on the torcular side of the plug, and the plug at the lower end of the verticle limb is placed in position without so much fear of jamming any particles into the general circulation. The vessel wall is then opened toward the torcular until the upper limit of the clot has surely been removed, removing as much bone as is necessary for freedom of manipulation, and to get well into the healthy sinus. The entire outer wall of the sinus should be clipped away with scissors in order to allow the abscess cavity to be drained in a perfect manner.

The most difficult cases in which to know just how to proceed are those in which we cannot determine the exact conditions within the bulb, and below it. The fact that we obtain profuse bleeding from the cardiac end of our incision in the sinus is not sufficient evidence that we have reached the end of the thrombus in that direction, because with a clot situated below the jugular bulb I believe we get as free hemorrhage as where the vein is free. This is due to the fact that very little of the blood flowing from the bulbar end of the verticle sinus passs through the jugular vein. The greater part is supplied by the inferior petrosal sinus entering into the bulb. This is shown by the fact that little influence is produced on this flow by compressing the jugular vein in the neck, and by the flaccid condition of this vein when exposed, also by the rapidity with which it fills from above, compared to that with which it fills from below. Therefore, profuse hemorrhage only indicates that the bulb itself is comparatively free from the clot, for it may be obtained with a complete thrombus situated in the jugular vein, or with a partial one in the bulb.

It is claimed by some writers that it is a serious error to curet the lower portion of the verticle sinus and that portion leading to the bulb before first resecting the jugular vein, but I am inclined to think this is a little radical in view of the excellent results that are often obtained by this method. It is obviously impossible to curet the bulb itself, on account of its anatomical position and the double curve that would have to be overcome, so that it seems to me if we can dislodge the clot, that in all probability exists above the bulb, and in this way obtain free bleeding, the rush of blood through the inferior petrosal sinus would have a tendency to force any portions of thrombus that may remain into the open wound. In order to direct the stream from the inferior petrosal in that direction, and in fact, during all manipulations of the lateral sinus, the jugular on the same side should be compressed by an assistant. If small particles do remain, in a good many instances they can be taken care of by the economy under its improved conditions, and although there is no way of telling, in some instances we may presume that the lower portion has not become infected. I feel sure that in this particular class of cases this is a safe and conservative procedure, especially in view of the added risk involved in the prolonged operation of jugular resection. I say prolonged, because, while the operation itself in skilled hands does not take long, considerable time is consumed in preparing the patient, and making ready for operation in a new field. If our conservatism and hopeful surmises prove incorrect, and we have not sufficiently eradicated the focus of infection, so that the economy can care for the balance, indicative symptoms will appear in a few days, and we can then under improved conditions, rapidly remove the vein. I know that this admission of occasional failure is open to the criticism, that in the meantime thrombosis may have extended into the inferior petrosal sinus, and be practically beyond our reach, but even the performance of a jugular resection at an early date does not preclude the occurrence of this event, and in view of the many successful cases treated in this manner, unless we are sure of somewhat extensive thrombosis in the bulb, I think it is the course that gives in most instances the best chance to the patient. I do not fully agree with those who think a second operation is more liable to be fatal than a single prolonged one. One of the worst cases I have seen was the one mentioned earlier in this paper in which there was extreme toxaemia, pus in the jugular vein, and infected glands in the neck, yet it seemed certain that death on the table would be the result if we persisted in finishing the operation on the first attempt, so the patient was put to bed before the jugular or glands had been touched. Within the next three days, owing to the removal of part of the infecting focus, the patient showed considerable improvement, and the jugular vein and glands were removed, the child making a perfect recovery in a short time. If I am not mistaken, it is the opinion of many general surgeons, and the opinion is becoming more widespread, that it is better to do prolonged operations in two stages, than to maintain anaesthesia too long at one time, and I think this applies to cases of jugular thrombosis where the resisting power is generally low.

Of course, if on curetting the lower portion of the lateral sinus, and as near to the bulb as possible, wo do not obtain free bleeding, it is an indication that the return flow from the inferior petrosal sinus is retarded either by thrombosis of this vessel itself or by a clot in the bulb, and in these cases I think resection of the jugular is advisable.

In addition to the actual operative treatment of thrombosis, the after care of the patient is of great importance. Saline enemata to compensate for the blood that is, of necessity, lost are of great value, and persistent stimulation should be maintained.

40 West Forty-seventh Street.

Spirographs or Nasal "Breath Pictures." WYATT WINGRAVE, *Lancet*, Jan. 26, 1907.

The practice of testing nasal potency by breathing upon a prepared surface is by no means new, but its usefulness has been somewhat restricted by the want of a satisfactory material. Slate, glass and polished metals all have their shortcomings, but I have now found that vulcanite, with a medium polish, gives a very reliable and faithful image. By placing the plate horizontally on the upper lip half an inch from the nostrils and giving one short and steady expiration a well-defined steam impression results, and evaporating affords reliable and striking evidence of the actual and relative patency of the nostrils. The image may be temporarily fixed or rendered more conspicuous for demonstration purposes by lightly powdering it with calcined magnesia or fine starch. Small sheets of vulcanite with a suitable surface and of a convenient size are supplied by the Medical Supply Association, 228 Gray's Inn Road, London, W. C. THOMSON.

REPORT OF A CASE OF EXTRA DURAL ABSCESS.*

BY CLARENCE PORTER JONES, M. D., NEWPORT NEWS, VA.

Gertrude Norman, a colored girl, aged 20 years, was taken on May 3, 1907, with pain in the right side of the head and chilly sensations; the pain in about two hours becoming distinctly aural. Three days later, immediately after an almost unbearable wave of pain, lasting about two minutes, pus tinged with blood was seen to flow in a large quantity, from the ear canal. Temperature now 103 degrees F. per os. On advent of the pus-flow, she became much more comfortable, temperature became a degree and a half lower in a few hours.

I saw her on the morning of the fourth day after the initial attack. There was at that time an opening in the drum sufficiently large to permit of free drainage; a thin greenish pus, slightly blood-tinged, was coming from the middle ear, also there was some swelling of the skin lining the upper posterior auditory canal wall. There was marked tenderness on pressure over the tip of the mastoid process. Temperature 100° F. per os, tongue foul. A simple cleansing solution was ordered to be applied warm, by means of a sterile medicine dropper, as follows:—fill the ear canal, then gently compress the bulb of the dropper so as to cause the fluid to run back and forth up and down the barrel,—the patient lying on the opposite side. This method is practiced till the ear seems clean, which may take several minutes, is repeated every hour during the day, and at three-hour intervals during the night. In intervals between cleansing the patient was told to lie on her back. A brisk mercurial was given, and sulfonal to induce sleep. The next day the temperature was 101° F. per os, tenderness over the whole mastoid, swelling of the soft parts, distinct pitting on pressure. There was sagging of the upper posterior canal wall to such extent as to make inspection of the drum well nigh impossible.

Operation was advised, but advice on this matter was promptly refused by the patient. She had had an abscess opened by a surgeon about two years prior to this, from which she suffered much pain, thus causing a morbid fear of operations. She was healthy and robust, and other than the simple abscess just mentioned, she had never had an illness. Her condition remained about the same—discharging greenish, blood-tinged pus, with small pieces of bone, tenderness and pitting on pressure over the mastoid, temperature from one to three degrees above normal and subjective pain. This last symptom became so unbearable that she at last, on the 24th of May, twenty-one days after onset, consented to operation. Accordingly, I sent her to the Dixie Hospital and operated just as soon that day as the arrangements could be made.

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*Read before the Seaboard Medical Association of Virginia and North Carolina, Norfolk, Va., December 18, 1907.

The whole mastoid was broken down from antrum to tip into one large cavity, whose external wall, or cortex, was as thin as an egg shell, being easily penetrated by the gouge without the use of a mallet. The cavity, as well as the middle ear, contained pus of the same general character, small pieces of bone, gritty in appearance and debris. The ossicles were gone. Through the roof of the antrum there was a circular opening about three-eighths of an inch in diameter leading to an abscess in the middle fossa of the skull—an extra dural abscess. Sufficient of the skull wall was removed to make a thorough exploration for the purpose of confirming the diagnosis. The abscess cavity was large enough to contain two and a half drachms of pus. The cavity, as well as the whole wound, was irrigated with hot salt solution, and packed with iodoform gauze, in long strips.

The temperature for the next twelve days after the operation averaged 99¼° F. per os, varying from normal to 100½° F. per os. On the third day after operation meningeal symptoms, as headache, restlessness and delirium, developed. The wound was then dressed, and some more pus, about a drachm, came from the abscess cavity. The same flushing and packing was employed as before. The next day there developed complete paralysis of the external rectus muscle of the right eye. The patient became wild at times, worse at night. The bromides, opium, chloral and hyoscine were tried to no avail. After five days of suffering, antipyrine, ten grains, and soda, fifteen grains, were given every six hours. The headache, delirium and restlessness disappeared as if by magic. Whenever there was the slightest headache, even after the patient was up and about, one of these powders would relieve it.

On June 6, the temperature suddenly rose to 103° F. per os late in the afternoon. The next day in dressing the wound, the patient for the first time complained of much pain on pulling the gauze from the abscess cavity, it being to all appearance clean. I did not repack the cavity. The temperature from this time on remained normal (reaching normal in about twenty-four hours), and healing was most rapid. She left the hospital on June 13. The paralysis of the external rectus muscle of the right eye did not wholly disappear till the latter part of July, sixty days after its appearance. As a tonic and alterative strychnine and syrup of the iodide of iron were given from one week after operation till the last symptom had disappeared. She is now perfectly well.

The case presents several points worthy of note:

First—The risk run by her obstinacy; she refusing operative treatment for so long a period while continually suffering with unmistakable symptoms of mastoiditis.

Second—Paralysis being confined to one cranial nerve, the right sixth. According to Toldt's Anatomy, this nerve at a point in the middle fossa, for a short space, pierces the dura, and is protected by none other structure than its sheath. Thus any pus which may gravitate here may set up a neuritis, causing paralysis from pressure of a swollen sheath, impairing the function of its fibers.

Third—The good effects obtained by the use of antipyrine and soda in treating cerebral congestion,—when other drugs had failed. I have since tried these drugs in conditions where a depletion of the cerebral capillaries is to be desired with most satisfactory results.

Fourth—The irritating action of the packing in the abscess cavity after the discharge had ceased; as exhibited by a rise of temperature on June 6, thirteen days after the operation; and its prompt return to normal upon abandoning the packing. Likewise the rapid healing.

118 Thirty-second street.

Case of Acute Suppuration in a Thyroid Adenoma Due to the Bacillus Typhosus. F. F. MELANDRI and T. P. LEGG, *Lancet*, Jan. 25, 1908.

The case is described by the title. Acute abscess of the thyroid is not a very common occurrence, and when it does occur, apart from traumatism such as puncturing a cyst, it is more often observed in connection with an acute febrile tissue, and generally at a late stage of the illness. THOMSON.

A REPORT OF THREE CASES OF LARYNGEAL GROWTH REMOVED BY DIRECT LARYNGOSCOPY.*

BY JOHN MCCOY, M. D., NEW YORK.

In a certain proportion of cases the removal of a laryngeal growth by the indirect method, i. e., laryngeal mirror and down curved forceps, is accomplished with comparatively little difficulty. There is, however, a proportion of cases in which this operative procedure is not only difficult of accomplishment, but is also at times dangerous to the vocal structures of the larynx. In this latter class of cases the comparatively recent method of attacking the growth directly through a straight tube has yielded me such excellent results in the way of precision and accuracy of removal, that I feel justified in reporting three such cases that have come into my practice during the past six months.

Case I. In November, 1907, Mr. K., age 54 years, was referred to me with the history that he had been hoarse for three or four months, that he had lost several pounds in weight, and that a physical examination had failed to reveal any apparent cause for this latter condition. On examination of the larynx a growth was seen projecting from the inner surface of the left cord. The growth was about half the size of a pea, and was attached by a broad base to the mid portion of the cord. It was pale pink in color, as was also the mucous membrane of the cord surrounding it. The necessity of removing the growth was urged in view of the possibility of malignancy. Three careful attempts on three different occasions were made to remove the growth by the indirect method. The patient, however, was so extremely nervous that the minute he saw the forceps going into the mouth, his pharynx would contract and he would grasp my hand. The third attempt was a repetition of the first and second; training seemed to be of no avail. The patient himself then asked if there were not some way in which the operation could be done while he was asleep. The direct method was suggested, and to this he readily assented. He was sent to the New York Eye and Ear Infirmary on November 10. That afternoon he was given a preliminary hypodermic of morphia, gr. ¼, the larynx was cocainized, and he was then placed under chloroform anaesthesia. The straight laryngeal tube was then passed into the pharynx and the epiglottis was hooked forward. The instrument used was the separable speculum of Dr. Jackson, as it possesses a leverage bar which makes it easy to bring the larynx into line, and easy for the assistant to hold it there. The growth was readily seen, and about half of it accurately cut away with a long, straight cutting forceps. An unlooked for contingency then arose. Although the anaesthetic used was chloroform, there was an excessive bronchorhea, and when this became tinged with the blood from the wound, it clouded the field of operation as well as the lamp in the tube, and caused delay in removing the rest of the growth, during which the patient partially came out from the anaesthetic and had to be re-anaesthetized. This complication, therefore, interfered with the rapid progress of the operation. It was finally controlled by the hypodermic injection of atropia, gr. 1-100. The operation was then completed by the accurate removal of the rest of the growth in another bite of the forceps. Examination of the growth showed that it was benign in character, a fibroma. The patient's voice was quite restored, and he has reported to me every three months since, to see if there is any indication of recurrence. There has been none, however, and examination to-day reveals a slight thickening at the base of the original growth.

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*Read before the Section on Laryngology and Rhinology of The New York Academy of Medicine, April 29th, 1908.

Case II. Mr. S., age 20 years, was on February 25, of this year, taken to the University Bellevue Nose and Throat Clinic, by his physician, who gave the history that the young man had been growing increasingly hoarse for the past three months, his general health was good, and he thought he had gained some in weight since his hoarseness began. The doctor and another physician had given him a thorough physical examination, and could find nothing abnormal in the lungs or elsewhere. Examination of his larynx proved to be somewhat difficult, as he had a short overhanging epiglottis which almost completely hid his larynx from view. This combined with a nervous timid disposition, rendered a view of the larynx quite difficult. On deep inspiration, however, one could see a growth in the interarytenoid region, which quite prevented an approximation of the cords. This was considered a good case for the direct method, and it was adopted at once, as it was felt that it would be a loss of time to attempt the indirect method in this timid shrinking lad, with the anatomical obstruction above mentioned. He was placed in the New York Eye and Ear Infirmary, and on February 26, he was operated upon. He was given a preliminary hypodermic or morphia, gr. ¼, this time, combined with atropia, gr. 1-100. His larynx was cocainized and chloroform anaesthesia was given. The straight tube was passed to the larynx and an excellent view obtained. A good sized growth was seen in the inter aryrenoid region, extending from just below the cords to the upper limit of the larynx. It was pale in color, and papillary in appearance. It was removed, piece by piece, with the straight forceps. The difficulties encountered in this case were that the patient seemed to come out from deep anaesthesia very quickly, and would commence to struggle. This necessitated some delay in getting him well under again. Also he did not seem to the writer to bear the combination of the two depressants, chloroform and cocaine, very well, as evidenced by a pulse which was more rapid and weaker than it should be, and by an unhealthy bluish color of the skin. These symptoms, while not alarming, were not reassuring. Examination of the growth showed it to be a hypertrophic tuberculosis. The young man was advised of the nature of his trouble, and told also that in all probability there was a small focus of the same nature in the lung. He at once took advantage of an opportunity that he had to go to Denver, and I think that he has at this early stage, a very good prospect of complete recovery.

Case III. On March 20, a young lady, age 24 years, was referred to me with a history of hoarseness extending over two months. In all other respects her health was perfect. Examination of the larynx showed a circumscribed thickening at the base of the left arytenoid. As she was extremely apprehensive, and very much averse to any instrumentation for the purpose of removing the growth, the direct method under anaesthesia was suggested, to which she readily assented. She was placed in the hospital, and on March 21, was given a hypodermic of morphine and atropine. the larynx was cocainized, and she was placed under anaesthesia. In this case ether was used, and given to complete anaesthesia. The straight tube was passed, an excellent view of the larynx obtained and the growth removed with absolutely no inconveniences or interruptions whatever. The atropia seemed to control the secretions from the bronchi, as there was no bronchorhea. The patient was at all times in perfect condition, and the operation was ideal from the operator's point of view.

After removal of the growth the arytenoid cartilage seemed to be unduly large, and the possibility of a chondroma was thought of. The examination of the specimen obtained showed it to be chronic inflammatory thickening. The patient has been kept under observation, and as her voice is quite restored, and no difficulty with the cartilage has developed, it is to be presumed that she is cured.

In conclusion the writer would draw the following inferences:

That in a phlegmatic patient this operation could readly be done with the use of cocaine only.

That in nervous, sensitive patients anaesthesia is to be preferred.

That ether anaesthesia is to be preferred to chloroform because of its greater safety, and because the patient once under the anaesthetic remains so a longer time, and therefore gives us a better chance to finish our operation without interruption.

That a combination of morphine and atropine is a good preliminary injection, as the atropine seems to control any tendency to excessive bronchial secretion.

157 West Seventy-third street.

Open Safety Pin in the Œsophagus of a Child Aged Five Months.

J. S. Manson. *Lancet*, Jan. 4, 1908.

A male child, aged 5 months, was admitted to the Oldham Infirmary on October 26, 1908, with a history of having swallowed a safety pin one hour previous to admission. A skiagram was taken and the pin was seen to lie about the middle of the oesophagus, open with the point upwards. It seems a hopeless task to try to get the pin up by means of a probang, so it was resolved to push the pin down into the stomach and hope for the best. An ordinary stomach tube of small size was pushed down the oesophagus, and after withdrawing another skiagram was taken showing the pin lying in the stomach. The child was kept in bed and watched carefully. Milk diet was given, and four days after admission a dose of castor oil. On the afternoon of November 2nd the pin was found sticking half-way out at the anus. The pin took six and a quarter days to accomplish the journey from the mouth to the anus, and only once or twice did the child seem at all fretful. The case seems worthy of note in showing the power of the alimentary canal in dealing with a foreign body of a somewhat formidable nature.

Thomson.

CONGENITAL DIAPHRAGM OF THE LARYNX.

BY GOTTLIEB KIAER, M. D., COPENHAGEN, DENMARK.

This case of congenital diaphragm of the larynx is of interest because of its rarity. Altogether only eighteen cases have appeared in the literature, although Turhelle published the first as early as 1869 (*Berlin klin Wchnschr,* 1869, No. 50, page 547); Harmer (*Wien klin Wchnschr,* 1902, No. 46, page 1217), is the only one who has observed the formation by section. Of course, the very common cases, mentioned by Schroetter (*Vorlesungen uber Krankheiten des Kehlkopfes,* 1887, page 239), in his lectures, where the anterior commissure instead of forming a sharp angle, is transformed into a little bow.

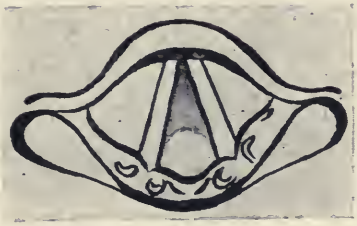
The congenital diaphragm is located, as a rule, in the most anterior part of the rima glottidis. Only three cases are reported where it took its origin from the anterior surface of the wall of the larynx at the level of the vocal cords, Chiasi's (*Wien klin Wchnschr,* 1897, No. 25, p. 607); Fraenkel's (*Deutsch Med. Wchnschr,* 1902, No. 51, page 909), and Harmer's Turhelle and Rosenberg (Heymann's Handbuch der Laryngologie and Rhinologie, Bd. I., page 523, 1898), have had each one case, where, in addition to the membrane in the rima, another was seen above this. It is remarkable that the diaphragm is so very rarely discovered at autopsy. Probably this is due to the manner in which the larynx is examined, namely, by splitting it in the anterior midline from below upward, by which procedure the membrane was overlooked when situated anteriorly and seen only when it occupied the exceptional position extending from the back wall.

Nothing certain is known about the cause of this condition. Scipet (*Berlin klin Wchnschr,* No. 2, p. 24, 1889) supposed that it was due to a hypertrophic chorditis vocalis occurring in intraterine life; but almost all observers believe that the cause must be sought for in an adherence of the normal epithelium of the inner part of the larynx. Something like this is seen in the duodenum where epithelial occlusion is found normally at a certain stage of development and where congenital occlusion of the bowel is met. (Tandler, cit. by Fein, Der Angelborene Kehlkopfdiaphragma, 1904.) One thing, however, is certain: there can be no question of a simple reforming of a binding web from the epithelial mass.

The patient is a woman, twenty-six years old, strongly built, of healthy appearance. According to her mother, she has been hoarse from birth. At the age of five years, she had typhoid fever; the next year she had croup, with slight stenosis. She has six brothers and sisters, all sound.

She came to me in October, 1905, on account of hoarseness. The voice is hoarse, without tone, and cannot be reinforced by energetic effort. She whistles well and has cultivated this gift especially as she cannot bring forth a single singing tone. On going upstairs quickly, she becomes short of breath, although she can ride a bicycle without difficulty.

Externally the larynx is perfectly normal. Laryngoscopy shows a normal mucous membrane without scar or thickening. Extending along the vocal cords there is visible a thin, grayish white, slightly glistening membrane without vessels. It occupies the anterior three-fourths of the rima glottidis, ending behind with a sharp, concave edge. The diaphragm is thinnest in the middle and behind where it becomes very thin and filmy, but at the sides, and especially at its attachment in front, it becomes more fibrous. The vocal cords are seen distinctly as two whitish flat bands with rounded edges. During deep inspiration, they are abducted to their full extent, lying close against the wall of the larynx. During intonation, the membrane disappears, the vocal cords, approximate themselves closely, but gape slightly posteriorly. No other abnormality is seen.



Operation.—By the galvano cautery, the diaphragm was cut through in the middle line from behind forward. At first the web was easily burned through, but quite close to the base anteriorly it grew very tough and thick, much more so than I had expected. Immediately after the operation the voice was unchanged, but the patient was astonished by the great amount of air she was suddenly able to draw into her lungs. During the days following, there was some reaction. Daily applications of menthol in oil were made.

Three weeks later the patient had to return home. She was advised to take frequent deep inspirations and to apply to a physician. She did not follow the latter advice, and the next year paid another short visit to Copenhagen. The vocal cords then appeared to be connected in their anterior third by a grayish white membrane, with a concave free edge behind. The voice was the same as before the operation.

The question is whether we have to deal with a congenital or acquired diaphragm, as either may be located at this place between the vocal cords. The acquired, due to ulcerative processes of typhoid, syphilis, tuberculosis, scleroma and diphtheria, and following tracheotomy in children, never has the perfectly regular structure which distinguishes the congenital, where the vocal cords are freely movable and can be abdicated to the fullest extent without losing their symmetry, as in this case. Moveover, nowhere did the mucous membrane of the larynx show signs of erosion. Everywhere it was smooth and normal. The statement of the mother that the voice was hoarse since birth, only further confirms the diagnosis.

During intonation the diaphragm disappeared, the vocal cords pushing themselves over it like two flaps, which is explained by its wedge-shape. The appearance of the membrane was very thin and filmy behind, more dense and solid in front. On cutting through it, the knife passed through the posterior portion very easily, but the extreme anterior part was thick and tough. The diaphragm is, therefore, wedge-shaped, with a broad base in front, a plane superior surface and a strongly concave inferior surface. During intonation the current of air passes easily backward between the free parts of the vocal cords without pushing the membrane up. This explanation does not always suffice as in the thirteen cases collected by Fein. The result of treatment, with regard to improvement of voice, was negative. As frequently happens, there was reformation of the diaphragm, beginning in the anterior commissure. The result might perhaps have been better if the treatment with Schroetter's Bougies could have been carried out. In the perusal of the literature, one very often sees that the result of protracted treatment shows small return for the effort. One is almost tempted to advise against all treatment in those cases where the only aim is improvement of the voice.

CONGENITAL DETACHMENT OF FAUCIAL PILLARS AND ISOLATION OF PALATO-GLOSSUS MUSCLE.

BY PERCY FRIDENBERG, M. D., NEW YORK CITY.

Clefts and fissure formations of the soft palate are, as is well known, frequently a result of destructive changes accompanying inflammation during childhood or of specific syphilitic ulceration later on. Similar defects in the faucial pillars, especially those of a bilateral and symmetrical arrangement are almost invariably congenital and correspondingly rare. The unusual character and infrequency of the structural anomaly indicated by the title suggested the report of the following case:

Arthur K., aged twenty-one years, consulted me for the relief of nasal obstruction and other symptoms which were found to be caused by a marked and irregular deviation of the nasal septum. In the course of a routine examination, inspection of the oral cavity revealed the striking picture which is represented on the accompanying illustration after a sketch from life, and which may be described as follows: Besides the single large central entrance from the oral to the pharyngeal cavity bounded by the pillars of the fauces, and representing an isthmus, there are two smaller lateral openings, like arcades, through which the side walls of the pharynx can be plainly seen. These openings are bounded laterally by the side of the mouth and gullet with normal mucous membrane, and medially by what appears to be a supernumerary anterior faucial pillar running from the lateral margin of the soft palate to the posterior portion of the tongue on either side, and entirely free of the oral or pharyngeal wall. This pillar contains muscular tissue, as is evident from its change of form and size on gagging and voluntary movement of the tongue and soft palate, and in form suggest a tackle or rope. Back of these rope-like structures the usual pillars appear. The posterior pair are rather rudimentary, approach nearer the median line than in normal cases, and appear to be adherent to the wall of the pharynx. The anterior pillars, too, are separated by an appreciable space from the lateral wall of the pharynx, so that they appear displaced inwards, and the isthmus faucium is markedly narowed. There is no sign of a tonsil on the right side. On the

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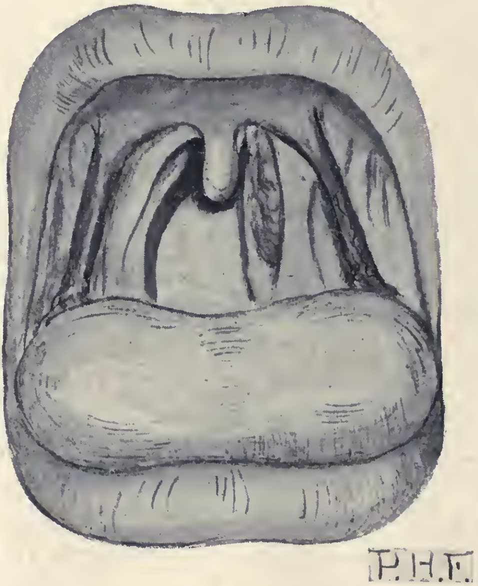
*Read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, April 29, 1908.

left, it is rudimentary.* With the exception of some adenoid hypertrophies in the vault, and the deviated septum already noted, there are no abnormalities in the upper respiratory tract. There is absolutely no disturbance of function which could give rise to complaint on the part of the patient. It is noticeable, however, that the voice has a decided nasal twang, and that certain consonants have the metallic timbre usual with cleft palate. This is quite naturally explained by the incomplete closure of the nasal space from the buccal cavity on phonation, due to the accessory openings on either side which cannot be obturated by the base of the tongue.



In this way a rhinolalia aperta, of very unusual origin is produced. Similarly, in an attempt to inflate the middle ear by Politzerization, air is blown out from the nares into the buccal cavity through the arcades.

A search of the literature shows that the condition described is a very rare one. Symmetrical clefts or split-formations in the pillars have been reported by a number of authors, but a condition quite analogous to that presented by my patient I have not found on record. The basis of such a congenital anomaly must be sought in the embryology of the pharynx. The investigations of His and others have shown that the second (hyoid) and the third (thyro-hyoid) pair of cephalic visceral or branchial arches (Schlund-boegen of German authors), or pillars bounding the primitive gill clefts, coalesce at an early period of foetal life to form the palato-glossal fold or anterior pillar and the plica triangularis with the tonsillar sinus. A failure of these two structures to unite would produce just such a clinical picture as that presented by my patient, i. e., a supernumerary anterior pillar, independent of the lateral wall of the pharynx and of the tonsil, and running free to the usual insertion near the base of the tongue on either side.

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*It is worthy of note that the patient has congenital amblyopia of the right eye, and heterochromia of the irides; the right being hazel, while the left is light blue.

It has occurred to me that the developmental arrest here noted may have its prototype in some lower forms of mammalian or even more primitive vertebrate life, as the piscine or reptilian, representing a form of recession or atavistic survival. Prof. Bashford Dean, whom I questioned on this point, was kind enough to give me the facts in the matter, which appear to show that there is no normal paradigma for this occurrence in lower animals. The soft palate or velum is found in mammals, the uvula in primates, only.

Of the fairly numerous publications under the title of congenital defect of the faucial pillars, reference to the original papers shows that only three cases, those of Wolters, Solis Cohen and Brockaert were at all like mine The others, notably six cases reported by Boucheron, and referred to by Newcombe, were cases of cleft palate with adenoids, defects of the velum (Fincke, Lefferts), perforation due to syphilitic or diphtheric ulceration (Newcombe), unilateral defects which may or may not have been congenital (Morrice, Schmiegelow, Newcombe, Jurasz, Garel, Meijes), split-like opening or fissure in one or other pillar (Rethi, Herzfeld, Hajek, Claiborne), fistula of tonsil (B. Fraenkel), or small symmetrical lacunae, generally oval and measuring about one and one-half cm. by three-fourths cm. (Toeplitz, Chiari, Newcombe), or admitting the tip of the little finger (Schapringer).

Wolter's case, published in 1859, is the earliest of which I can find any record, and antedates that of Chiari, referred to by a number of authors as the first, by over twenty years. It is strikingly different from the cases just reviewed, and the changes are shown in an illustration. The patient was an adult male, aged twenty-two years. The whole anterior surface of both tonsils was exposed, the place of the anterior pillar being taken by a cord-like structure on either side, running from the uvula symmetrically downward and outward to the lateral margin of the base of the tongue.

The posterior pillars were intact, the mucous membrane everywhere smooth and of normal color, and there was no trace of scars. Wolters says that the rope-like structures were simply the isolated palato-glossus muscles.

Brockaert, too, describes his case, that of a boy of eleven, as a true separation (véritable isolement) of the anterior pillars and gives an excellent illustration of the condition. The tonsils were rudimentary, but there was no sign of previous ulceration in the pharynx or pillars. The defect or lacuna in the anterior palato-glossal arch was oval and measured 14 mm. by 3.5 mm.

J. Solis Cohen's case, a man of forty, is the third of this sort, and was published under the title of "Case of Separate Investment of the Palato-Glossi Muscles," which describes the condition very well. The opening in the anterior pillar was about one inch long and narrow, but the lower end of the anterior pillar had a normal insertion and there was no indication of the accessory rope-like structure running to the base of the tongue. The inner and slender boundary of each abnormal opening was the main free portion of the palato-glossus muscle on each side respectively, the investment of the muscle being separate, instead of forming part of a continuous palatine fold.

These two cases resemble mine very strongly in the extent of the "defect" in the anterior pillar, amounting in all three to a real isolation or separate investment of the palato-glossus muscle, but there is an additional feature which distinguishes them both no less sharply from that described above I refer to the fact that my case shows a complete separation of both anterior and posterior pillars from the lateral wall of the pharynx, producing the arcades at either side and causing the isthmus of the fauces to have three openings into the pharyngeal cavity. As the lateral openings cannot be closed by the base of the tongue, the interference with phonation, already explained, is a characteristic symptom in this case which differentiates it from all those found in literature. In fact, Fincke (l. c.) erroneously gives the presence of disturbances of deglutition and phonation as an important differential diagnostic point in favor of previous inflammation and as proof positive that the defects were due to perforating ulceration and not congenital.

As to the explanation of the developmental anomaly, there has been much confusion. Most of the observers have contented themselves with the indefinite assumption of arrest of development, embryonic defect, or with some rather vague generality about branchial arches and gill clefts. Schmiegelow likens these defects to lacunae in the diaphragm, cribriform hymen, and developmental arrest in similar membranous structures, without giving any clear idea of their mode of development in the faucial pillars. Any logical explanation of this anomaly must, as a matter of course, be based on the study of the normal embryological development of the buccal cavity and pharynx, more particularly of the base of the tongue, and, above all, of the palato-glossi muscles in man and lower animals. An analogy might be found at some point in the series in the form of normally separate palato-glossi or accessory pillars.

Chiari considers the factor of a persistence of the branchial clefts in the causation of these symmetrical defects of the pillars, and notes that congenital branchial fistulae open at the base of the tongue on the lateral wall of the pharynx, but that the absence of any pouch or canal in connection with the defects precludes explanation based on this hypothesis.

Schapringer, whose patient, a woman of twenty-six, showed traces of a hare-lip which had evidently been healed during foetal life, believes that at some future time the explanation of these congenital defects will be given by comparative anatomy rather than by embryology.

60 East Fifty-Eighth Street.

Tuberculous Adenoid Vegetations With Demonstration of Koch's Bacillus. Dr. Rossi-Marcelli, de Naples. *Ann. des mal. de l'oreille*, 1894.

A young man of 17, without hereditary taint and with sound thoracic and abdominal organs, was found to have adenoid vegetations of large size. Small portions of these were removed and submitted to the microscope, and were found to be one mass of tubercles. A bacterioscopic examination showed the presence of Koch's bacillus in all parts of the preparation. Scheppegrell.

REPORT OF THREE UNUSUAL CASES OF NASAL DISEASES.

BY G. C. HALL, M. D., LOUISVILLE, KY.

While for the proof of most things a series of cases is desirable, or even necessary, it is often not within the scope of the individual worker. To those of us especially who live away from the larger centers of population, it is not given to see a great many of the unusual cases; however, it seems to me that we are none the less liable, for the failure to report such cases, even if a series is impossible.

It is this consideration that prompts the report of the following cases, which, though of varied conditions, hold something of peculiar interest to the Rhinologist, either on account of the novelty of the conditions or the unusual manifestations presented.

Case 1.—Septal resection complicated by Syphilis.

G. F., age 30, white, male, married. Occupation, blacksmith. Patient was referred to me by Dr. Ira S. Kerns of this city for nasal examination. April 24, 1907, patient's general health was good, though he had lost some weight in the last few months. His trouble began eight months previously with a "cold." He had lost his sense of smell completely, so was not conscious of any odor from the discharge of the nose. The patient complained of the discharge both from the nose and in the throat, that he continually had a "cold" and breathed at all times through his mouth, which was dry and foul every morning; that he had a dry cough, except in the morning, when for an hour or more he coughed up "lumps of sticky mucus." He also spoke of headaches, which commenced directly above the root of the nose and radiated to above the ear, worse on left side. The patient also complained of epistaxis, sometimes severe, which would come on especially while shoeing a horse or working over the forge, and during the examination, the tissues were prone to bleed at the slightest instrumental interference. The patient had no history of being a bleeder.

Examination revealed a nose absolutely blocked up. The inferior turbinates were engorged and inspection was impossible beyond the vestibule. The surfaces were moist and covered with a thin watery mucus. Shrinking with suprarenalin-cocaine showed the turbinates hypertrophied. The septum was irregularly deviated and in the neighborhood of the anterior ends of the middle turbinates bulged out on both sides, coming in contact with the turbinates.

The patient, on being questioned closely in regard to a possible fracture of the nose, then remembered that several years previously, while "breaking" an unruly horse, he had been struck violently in the nose by the horse throwing his head back. This evidently accounted for the thickened irregular septum.

The nose was next carefully examined for pus at the openings at any of the sinuses, and the frontal sinus and antrum were examined by trans-illumination, but showed clear. The symptoms and examination both pointing to the left side as the worse, I decided to remove the left inferior turbinate which was very much hypertrophied, both to relieve his respiratory distress and to gain room for further operative procedures. This was done April 27, 1907, under cocaine and suprarenalin. The patient stood the operation well. There was no pain or hemorrhage. The packing was removed on the second day and a paraffin splint inserted which was worn ten days, the patient meanwhile attending to his work. The splint was then removed and nasal respiration was possible for the first time in eight months. This splint was described by Dr. Moraweck and myself in an article in the *Journal of the A. M. A.*, February 24th, 1906.

Though the patient was in every way improved, his symptoms still persisted, though in a mitigated form. Accordingly, on June 8th, I did a subperichondrial resection of the septum. As before the patient stood the operation well, though it lasted nearly two hours, the membrane being adherent over the irregular areas, which evidently corresponded to the lines of the old fracture. The quadrilateral cartilage was infiltrated with lime salts, and had almost the consistence of bone.

The after treatment was uneventful, and the wounds were healing kindly with only the slight crusting that follows the operation, when, without apparent reason, the septum began to thicken. It became very red and angry looking, and encroached on the nasal chambers making nasal respiration very difficult again. Pain on the left side of the head again became severe, and the patient complained that he felt as though he had a cold all the time. He had profuse discharges at irregular intervals of thick yellowish mucopus, after which he obtained some relief from the head pains. I carefully searched for involvement of the sinuses without result. I ran the gamut of local and general treatment, and even advised a change of occupation in the hope of bringing relief; he having told me that he was compelled to work in a draught.

At every visit it was the same old story. Nose stopped up, discharge, pain in the head. The patient's general health was also affected, he having lost over ten pounds in weight. The most minute inspection failed to reveal the slightest cause for the now distorted and thickened septum.

The patient denied syphilis, and a thorough examination of his entire body also failed to discover any evidences of the disease.

This state of things continued up to the first of September, when I saw far up on the right side of the septum a minute spot of ulceration. Scrapings failed to reveal tubercle bacilli, so I at once cauterized the spot with acid nitrate of mercury, and put him on large doses of bichloride of mercury and iodid of potash, with orders to report any trouble by phone and return in a week.

September 8th. Patient returned much improved. No pain since last visit. No discharge. Nose open, he can breathe through it at all times. Septum becoming normal.

September 22d. Septum normal. No ulceration or thickening in median line. Ample space in both chambers. No discharge. No pain in head. Patient's general health improving, and he is gaining rapidly in weight.

September 29th. All symptoms in abeyance. Weight continues to increase. Mercury began to affect mouth, dose was reduced.

November 23d. No recurrence of symptoms. Patient continues to improve. Treatment continued. This was then a manifestation of syphilis in the nose. It might be pertinently asked where did it come from. The man has a wife and children who show no signs of the disease, nor aside from the nose has he ever manifested any.

Another interesting question also is how long it will be advisable to keep this man under treatment, and it is one I cannot satisfactorily answer at present. The case gave me an infinite amount of worry and trouble, and I believe it worth recording.

Case 2. Septal resection complicated by antral suppuration.

This is submitted as a preliminary report on a subject which I shall report more in detail later on. It apparently demonstrates that, notwithstanding the fact that though both membranes were perforated and a portion of one lost during a subperichondrial resection of the septum, such a condition does not necessarily result in a permanent perforation. As this case healed successfully in spite of very adverse conditions, namely, the presence of a suppurating antrum on the right side, I trust the method herein described may prove the solution of this unfortunate complication, and that by such a procedure as I describe, perforations arising from the operation may become a thing of the past.

Clinical History. C. K., age 27, white, single. Occupation, clerk. He has had trouble with his nose since a child, following an attack of scarlatina. For the last few years it has been worse. There is a muco-purulent discharge from the nose, worse on the right side, which discharges pus with an offensive odor. The sense of smell is impaired. Pain at times under right eye, worse in damp weather. There is some cough, and the voice is husky at times, due to irritation to the cords by the discharge passing to the throat.

He was hit on the nose by a ball some years ago and since that time the nose has been turned to the right. After the accident the right side of the nose was completely blocked and a specialist of this city removed some polyps and a bone, according to the patient's story. There was, it seems, no effort made to locate the source of the pus. No farther treatment was given. Pus, odor, pain, etc., still continued. The general health was affected but little, if at all.

An examination August 31 revealed the following: Tip of the nose is bent to right. Right side of the nose was completely blocked by the deflected septum, which extended over to the lateral wall. The mucous membrane was bathed in pus which discharged freely.

The deflection extended well into the bony portion and was displaced from the ridge below, the lower part of the septum being in the right nostril, while the maxillary ridge projected upward in the left as an irregular bony ridge. The left nostril was spacious on account of the deflected septum, but the turbinates, especially the inferior, were hypertrophied.

Transillumination showed the right frontal sinus and antrum dark, the left clear. Tenderness on pressure on the right side was well marked. As treatment failed to influence the symptoms on the right side and as access to the sinuses was impossible, I determined to correct the septum in spite of the pus. Accordingly on September 29 I did a subperichrondrial resection of the septum, working from the left side.

The operation was long and difficult and the removal of the maxillary ridge caused sharp hemorrhage. I commenced my incision in the mucous membrane far back, curving upward as I reached the tip, so as to more effectually remove the ridge. Above, the membrane separated very easily on the left side, but despite the most careful dissection the membrane was perforated on the right side opposite the incision so that a through and through perforation existed, which bid fair to become permanent. In fact I informed the patient at the time that I thought in all probability such a permanent opening would be established. After the deflection was removed I smoothed out the edges of the wound and applied compound tincture of benzoin over the incision. Gauze strips were then packed on both sides of the nose. Considerable reaction followed the operation, but subsided after 48 hours, when the packing was removed. Our paraffin splints (See *Journal of the A. M. A.*, February 24, 1906) were then inserted on each side to maintain pressure and furnish support.

These splints were changed every three or four days and kept in place over two weeks. Notwithstanding the perforation on the right side and the continual flow of pus, which bathed it from the diseased antrum, it healed kindly and today not a suggestion of a perforation exists. This is the first case of this nature in which I have ever kept the splints in for so long a time and I feel amply repaid for so doing. I shall keep a strict account of similar cases and will report them whether I succeed in preventing the perforation or not. While puncture of the opposite side is a thing to be avoided, it will occur in a certain percentage of cases and I would recommend this method to operators who experience this complication. I would be glad to furnish information as to the splints and the method referred to, to anyone to whom our article is not accessible. I would also feel indebted for case reports, whether failures or successes, after employing this method.

Case 3. A Large Naso-Pharyngeal Polyp.

This case is of interest on account of the mistaken diagnosis and the number of operations the patient was forced to undergo without any relief. The history is as follows: E. E. Von R., age 35, white, male, married. Trouble with the nose had existed for years. The left side was stopped up at all times. On forced inspiration a small volume of air could be obtained, but on expiration the stoppage was absolute. This, it seems, would have been sufficient to have made a diagnosis, though it was apparently not considered seriously in his previous operations, nor by myself during the first operation.

He was operated on first in 1892, in Butte, Montana. The inferior turbinates were cauterized with the galvano-cautery and the tonsils removed. This, however, did not clear up the trouble on the left side of the nose. In fact the patient thought he slowly became worse. Nothing more was done for several years, when the patient consulted an eminent rhinologist of Chicago, who removed the adenoids and snared off the posterior end of the inferior turbinate. These procedures likewise failed to relieve his trouble and the chiseling of a bony spine off the posterior portion of the septum was advised and declined, the patient being about to leave Chicago. He consulted me on October 10, 1907. Examination of the nose showed a thin, narrow nose, small nostrils. Right side of the nose free, turbinates not engorged. Left side of nose apparently free along the inferior turbinate except for a small projection on posterior portion of the septum already referred to. However, it was possible to look beyond this to what was apparently the posterior wall of the naso-pharynx. The middle turbinate on the left side was enlarged and pressed for its whole length against the septum. It was practically impossible for him to blow the left nostril, though a fair amount of air could be taken in on inspiration. An examination of the throat revealed the remains of tonsils now submerged, with diffuse redness over the whole pharynx and a granular condition of the posterior wall. An examination of the naso-pharynx was attempted, but it was impossible to use a mirror, as the slightest attempt caused retching. I therefore refrained from inserting my finger in the naso-pharynx out of consideration for the feelings of the patient, and there is where I made a serious mistake, for I feel had I done so at the time I would have saved the patient an operation and its attendant inconvenience.

He came to have the spine on the septum removed, but I assured him that this could hardly be the sole cause of his difficulty and advised the resection of the middle turbinate.

On October 15 I removed the middle turbinate and the bony spine on the septum with very little trouble and the patient was able to blow his nose at the conclusion with comparative freedom, though not without effort. I was puzzled at the time, but thinking that things would right themselves I did not proceed farther, but packed the nostril as much to prevent adhesions as to control hemorrhage. After twenty-four hours the packing was removed and a long paraffin splint inserted. This of course necessarily prevented very free respiration on that side so that the result of the procedure was in doubt. However, on removal of splint his condition was very little if any better than before. After waiting several days with no improvement I again thoroughly cocainized the nose, on October 26, for further operative procedure, as I supposed an adhesion between the posterior part of the septum and the inferior turbinate had taken place. Careful inspection of the now shrunken nasal structure failed to reveal any adhesions and I inserted my finger into the naso-pharynx for a possible solution of the difficulty. On the left side my finger encountered a large, smooth, soft mass, the nature of which I was unable to determine, but which was attached to the outer wall of the naso-pharynx. I want to confess that even at this point I did not suspect the large solitary naso-pharyngeal polyp as being the cause and can only plead in extenuation that two other good men had likewise failed to discover it. My attention was now directed to the examination of the nose and I now discovered that what I had taken for the posterior wall of the naso-pharynx was the anterior surface of this growth.

The difficulty of examining the naso-pharynx and the fact that the growth moved when the patient said "K" or "cuckoo," led me into this error. On passing a thin-bladed instrument through the nose for the purpose of determining the extent of attachment of the growth, it was dislodged and fell into the pharynx and so out of the mouth of the patient, much to his delight and with entire relief of all his symptoms.

The growth was pear-shaped and measured ten millimeters. It was evidently freely movable and by its valve-like action completely blocked the left side on expiration, but by falling into the naso-pharynx permitted a small amount of air to pass on inspiration.

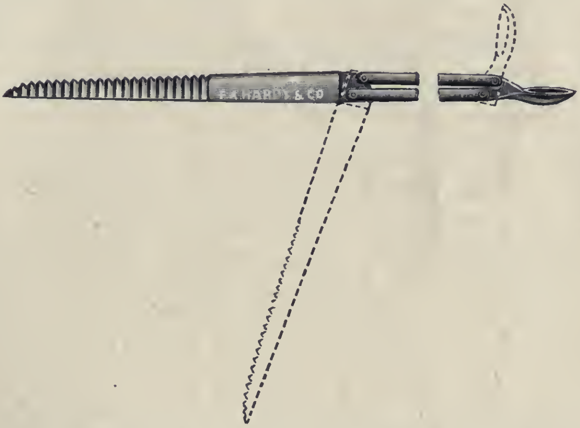
The growth had evidently been present for years and should have been discovered long before it was. However, I take no credit to myself, but feel that it taught me a lesson that I shall not soon forget.

Gaulbert Bldg.

A FOREIGN BODY EXTRACTOR.

BY CHEVALIER JACKSON, M. D., PITTSBURG, PA.

Soft foreign bodies, like dried uncooked beans and peas, roasted peanuts and like substances that are liable to crush under forceps, present difficulties in bronchoscopic extraction; and a number of fatal cases of failure, of attempted removal of such substances have been reported. No attempt at forceps extraction is justifiable.



For such bodies I have devised the instrument shown in the illustration. The spoon-shaped extremity is passed below the foreign body, then the spoon is turned at right angles by the handle mechanism, and the intruder withdrawn into the bronchoscope, as will be understood at a glance.

The illustration is actual size, except as to length.

430 Park Building.

Non-Tuberculous Intra-Nasal and Post-Nasal Abnormalities; Their Regarded Association with Tuberculosis. W. C. RIVERS, *Lancet*, Dec. 28, 1907.

This is a plea for a more complete investigation of nasal obstruction and catarrh as a predisposing factor to pulmonary tuberculosis.

THOMSON.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, April 29, 1908.

WOLFF FREUDENTHAL, M. D. Chairman.

PRESENTATION OF PATIENTS.

Congenital Detachment of Faucial Pillars and Isolation of Palato-Glossus Muscle. By PERCY H. FRIDENBERG, M. D.

Published in full in this issue of THE LARYNGOSCOPE, *page* 567.

Congenital Atresia of the Pharynx. By S. OPPENHEIMER, M. D.

The patient, a young woman of twenty, first came under observation a year ago, complaining of suppuration of both middle ears, and obstruction to respiration. The obstruction dated back seven years and the difficult respiration as far back as she could remember. The anterior nares showed a general condition of congestion. Inspection of the mouth showed adhesion of the posterior faucial folds to the posterior pharyngeal wall and a small opening about the size of a dime situated directly back of the of the uvula. The causation of her otitic condition was self evident. Dr. Oppenheimer said that he had seen several such cases, one congenital, the others following specific disease, five in all. Two were submitted to operation. In the congenital case an attempt was made to separate the membranous attachment from the post-pharyngeal wall, but the result was unsatisfactory.

The specific case was also subjected to operative interference and an obturator fitted in to keep the parts separated, but the result in this case also was unsatisfactory. Other cases operated upon by other men have been rather unsuccessful. The present case was shown to-night for the purpose of eliciting a discussion as to the most satisfactory means of operating upon this trying condition.

DISCUSSION.

DR. J. E. NEWCOMB said that up to 1897 he had found forty-two cases reported. Particulars were given in only thirty-one instances. Of these, twenty-five were splitting of the anterior pillars or the isolation of one or both and six of the posterior. One of the peculiarities of these cases is the almost invariable rudimentary character or absence of the tonsils. Just what the cause of this is no one seems able to demonstrate. About the only symptom complained of is that there is a little pocketing of the food in the recess caused by this peculiar condition. The term used by Dr. Friedenberg—the separate investment of the palato-glossal muscle, is undoubtedly the best descriptive term. Three cases formed the basis of the paper referred to. One was that of a woman with a specific lesion who applied for treatment, and the progress of the destruction could readily be traced; the tonsilar tissue had sloughed away and left the anterior pillar isolated. We are still very much in doubt as to the cause of this condition. Some have looked upon it as the persistence of the original bronchial clefts, but from the view-point of the embryologist there seems to be reason to think that that is not the best explanation. The French anatomists regard the condition as due to embryonic absorption of tissue which has been previously formed. During the last fifteen or twenty years, during which there has been such activity in reporting unusual cases, many more of the class under consideration have gone on record. Dr. Newcomb has made records of all such reports since the date of his own article on the subject and has found thirty articles during the last eleven years.

Dr. Berens said that the late J. E. Nichols in the Transactions of the American Laryngological Association for 1906 had described an operation for the relief of this condition of atresia. The operation secured fairly satisfactory results in that a fair amount of breathing space was secured. The operation consisted in passing a seton through the telum at its attachment to the pharyngeal wall, bringing it out in the median line and tying it. This is repeated on the opposite side. The setons were made of heavy silk plaited, at least one-eighth inch in thickness. He allowed them to remain in for six weeks, and then cut through the portions of the velum included in the ligatures—in other words, performed the old-fashioned web-finger operation. He had seen several cases and was able to follow them and most of them did well. In his own experience he has had seven or eight cases, and the majority have done well, but one or two were complete failures. He felt that he could advise the operation, with considerable hope of relief.

Dr. Emil Mayer said that his experience in this class of cases of atresia of the larynx was limited to the specific ones and these had been benefitted by the use of specially fitted hard rubber tubes made to bend at right angles, of various and increasing sizes.

These the patient soon learned to introduce and in time a large opening remains sufficient for the patient's comfort.

Dr. Freudenthal said that he remembered Dr. Nicholl's paper very well, and had his instruments. Something similar was advised by a German writer, who, after separating the adhesions introduced gauze through the nostrils and brought it through the mouth. Then he tied it firmly and claimed to get very good results. He had meant to try this on a patient who was in the hospital, but the patient left before the operation could be done.

Dr. Lederman said that he had seen described a similar operation to that described by Dr. Nichols, in which rubber bands were used instead of silk that cut through gradually by their contractile action. If a fair sized rubber ligature was employed, it was possible to obtain quite an area of separation.

It was a necessary step in the treatment of pharyngeal adhesions to continue the separation of the raw surfaces until all ulceration or the granulating wound had healed.

PRESENTATION OF PAPERS.

The Treatment of Fractures and Depressed Deformities of the Nose by a New Method with the Use of a Combined Bridge and Intranasal Splints.

By W. W. Carter, M. D.

To be published in full in a subsequent issue of The Laryngoscope.

DISCUSSION.

Dr. Harmon Smith said that the last case referred to by Dr. Carter had come more directly under his observation than the former, and upon that case he would state his observations. He thought the outcome more satisfactory than one had reason to expect when the unusual conditions existing at first, were fully appreciated, and he thought the operator certainly deserved to be congratulated upon the outcome.

The mechanical appliance presented seemed to meet many of the requirements that had been needed for a long while, but he thought it unwise to form a definite conclusion as to the efficiency of an instrument upon its application to one case.

The method pursued in this case resulted satisfactorily; but he believed that the infection of the skin would occur in some cases from passing the sutures from the nasal cavity through the skin over the nose.

He also thought that the mucous membrane flap was unnecessary to the outcome of the operation and only complicated it. He believed that even had it resulted favorably it would not have materially influenced the outcome. The full appreciation of the mechanical advantages of the instrument could not be seen until it was properly adjusted upon the nose with the supporting sutures in place. The pressure given laterally by this appliance was just what was wanted in these cases.

Dr. Berens congratulated Dr. Carter on the results obtained with the instrument, though of course it was still too early to say what would be the final result after cicatrization and contraction takes place in the case the nasal processes of which were entirely gone, the nasal processes have evidently been raised, and they have been raised so far—judging by the picture—that there must be still an interval of soft parts between the fragments and the superior maxilla. Whether these soft parts will ossify or will contract remains to be seen. The instrument will be of great aid in supporting the bony arch. He thought there was little risk from infection by the silk ligatures and most of this danger could be obviated by the use of a little collodion.

Dr. McCoy said that he had not seen Dr. Carter's cases, but that he had read the paper before the meeting, and thought the doctor was to be congratulated on the long stride forward that he has made in devising this apparatus. The treatment of these cases resolves itself into the treatment of recent and old fractures, where one has to go into the nose and rearrange the structures. Dr. Carter had spoken of the impossibility of passing a splint through so as to support the bridge, because the vertical diameter at the entrance is so much smaller than it is one inch further in the nose.

That is quite true when you speak of solid objects for splints. It has not been Dr. McCoy's practice to use solid splints of that character, but to pass into the nose small strips of gauze thoroughly impregnated and covered with bismuth subnitrate. These are packed from the arch down until midway of the nose is reached, and then a splint is put in to allow the patient to breathe through the nose. He had treated many cases of both recent and old fractures by this method and had found it quite satisfactory. The results were very good, though perhaps not so good as those shown by Dr. Carter to-night. In the old cases seen by Dr. McCoy, most of them had been fractured rather from the side of the nose, causing a fracture which is compound, i. e., through the mucous membrane and possibly the septum as well is fractured. Adhesions form between the nasal bone and the septum of the injured side and frequently there are adhesions on the other side. These are the most difficult kind of cases for submucous operations because of the adhesions on both sides. In old fractures he had tried something which he thought was new. Instead of using the Adams' forceps or hammer and chisel, he used a forceps with a very long handle and a small but firm grasping end. When the nose was entered with the forceps the forceps was placed on a horizontal bar and the patient's head held very firmly, now working the long handles by force of leverage he was able to break up the arch. He had used this method in five or six cases of old fractures. In some this instrument would not break down the nasal process of the superior maxilla, as the force was not sufficient, but in the other cases the results were extremely satisfactory.

DR. MYLES said that he felt impelled to add a word of commendation. Dr. Carter had undoubtedly made a proper application of the rules of mechanics, and it was only a question of experiment as to the usefulness of the instrument. The operation is done for cosmetic purposes, and the risk of injuring the face by infection or suppuration has always to be considered. Dr. Myles said that he has seen a great deal of Dr. J. O. Roe's building work of this character, and some of it had produced very remarkable results. It is still largely a question of experiment.

DR. CARTER, closing, said that he appreciated the manner in which the instrument had been received by the members and hoped that it would prove of benefit to the profession. He regretted that he had not enough cases to-night to present a conclusive demonstration, but he felt that the instrument was devised on strictly mechanical lines, and the construction of an arch was a question involving mechanics also.

In regard to the sub-mucous work, Dr. Smith did not seem to think very much of it and the results in this case would not lead one to think there was much in it but it was a very unfavorable case for sub-mucous work—one of the worst atrophic cases he had ever seen; but he felt convinced that the operation would prove of service where there was a healthy mucous membrane and tissue to work upon. The height of the septum must be increased in order to raise the dorsum, and this operation offered an opportunity for doing this without leaving a perforation in the septum.

Dr. Berens had spoken of the interval between the fragment and the nasal process of the superior maxilla. Of course, there is connective tissue between, but the process of ossification is so rapid here that bony union could be confidently expected. He did not think that Dr. Beren's suggestion with regard to collodion at the exit of the suture would be of benefit, for safety lies in the drainage by capillarity along the suture. He had noticed that if a scab is allowed to form there was a tendency for a litle pus to form around the suture. It should be kept perfectly clean with peroxide of hydrogen.

Dr. McCoy's suggestion of a more powerful instrument for breaking the bony arch was a good one.

He hoped that Dr. Myles would find the operation satisfactory. He believed that the mechanical principles involved in the apparatus were correct and that in using it there is not the slightest danger of increasing the deformity.

The Drainage Mechanizm of the Normal Accessory Sinuses. By S. YANKAUER, M. D.

Published in full in this issue of THE LARYNGOSCOPE, *page* 518.

DISCUSSION.

DR. MAYER said that he had followed Dr. Yankauer's experiments with great interest and agreed with him in the conclusions drawn. The writer had presented in an entirely new manner some novel theories and these helped to explain some reasons for the difference of opinion which some of us had as to the particular origin of sinus disease.

It seemed reasonable to accept the explanations given and the action of the ciliary bodies within the cavities of the accessory sinuses was not the least of these.

Another important fact is the rising of the fluid in narrow spaces instead of following the law of gravitation.

We thus can understand how fluid pours out of a cavity from a point higher than its base.

These interesting experiments will enable us to make our diagnosis with more unanimity and we will perhaps agree as to the source of disease in a particular cavity.

DR. FREUDENTHAL said that the action of the ciliary bodies as presented by Dr. Yankauer seemed quite natural, and appeared to be similar to that of the bronchi. The action of the latter was thoroughly studied by Professor F. Gaule of Zurich—they swing upward and bring forward everything that is in their way. He would like to know if Dr. Yankauer had made any studies on the ciliary bodies of the nose. He would also like to have Dr. Yankauer explain his remark about cold and dry air making the mucous membrane swell. According to his own clinical observation dry air does just the contrary—that is, when a person is exposed to it for any length of time.

Dr. Myles congratulated Dr. Yankauer upon his valuable contribution to this subject. For many years he himself has been studying these phenomena, some of which have puzzled him. Of course, the action of the cilia has always been recognized. They are the chief factors for bringing forward the secretion to the outlets; and this has been one of his chief reasons for not over-curetting the diseased mucosa, especially in the antrum of Highmore. His own explanation has been that the too and fro motion of the air during expiration draws the long continuous stream of the secretion out of the sinuses, and if one blows some powder on the inferior turbinal below the hiatus semilunaris one will notice that it moves backward, forward and downward.

The secretion of the frontal sinus, in diseased condition has always been a subject of great interest and he had sought for an explanation of the morning pain which becomes easier in the afternoon. The conclusion which he had reached was that the thick mucus gravitates to the opening of the naso-frontal duct when a patient is in the upright position and the gas forces it through and causes the pain in transit.

He has often noticed the condition referred to by Dr. Yankauer —the travelling upward of the secretion. There is no doubt of this; it will travel up from the middle meatus, between the middle turbinate and the septum against gravity. Dr. Yankauer had made some very interesting observations. Many are puzzled at times to determine definitely the sinus or sinuses from which the secretion comes. He had spent several hours watching their hiati, wiping them out, and trying to understand many of the phenomena of which Dr. Yankauer had spoken of to-night, and had so well explained by his physical demonstrations.

Dr. Freudenthal said that he would like to mention that inhalations could not be considered a valuable diagnostic aid. He had used them often to cause a headache to disappear when the headache was due simply by a post-nasal catarrh. However, they were not a diagnostic sign for accessory sinus trouble.

Dr. Yankauer said—speaking in regard to the effect of the inhalation of dry air upon the turbinals—that it was a fact that when the air is cold and dry the turbinals swell. Of course, the cause to which Dr. Freudenthal probably had reference was the continued inhalation of such air for a long time—he had referred to the immediate effects. The turbinals react with great promptness to changes in the heat, cold and dryness of the atmosphere. In regard to the test, he had been watching the effect of steam inhalations for many years, and had yet to find a case in which any other kind of headache except one caused by accessory sinus disease or by obstruction to the outlet of the sinus, was relieved by steam inhalation. He had known of cases in which so-called post-nasal catarrh was diagnosed in which one would get such a reaction, but closer examination will show that post-nasal catarrh is the result of sinus disease.

The matter of the test is of interest to the general practitioner, for he will find it a very simple and easy method of getting a hint as to the origin of these cases, particularly those where the patient either has no nasal secretion or is so accustomed to it that he thinks it is only natural and normal.

A Report of Three Cases of Laryngeal Growth Removed by Direct Laryngoscopy. By John McCoy, M. D.

Published in full in this issue of The Laryngoscope, *page* 560.

DISCUSSION.

Dr. Yankauer said that he himself had begun to do this work with the Kierstein Autoscope for examination purposes. One advantage which the direct method has over the ordinary method of operating upon the larynx is that one can operate under anaesthesia. One cannot use the mirror to advantage under an anaesthetic, but with this method you can operate at your own convenience and with as much certainty as with the usual method. It has, therefore, decided advantages with children. He had in the past year operated upon a case of papilloma of the larynx, in Dr. Voislowsky's service on Staten Island, which was, however, unsuccessful. It was a case of recurrent papilloma, in which a tracheotomy had been done; the larynx was filled with soft masses, and although there was a good view of the larynx, and the instrument could be introduced readily, as fast as the mass was removed more took its place. It was found necessary to do a laryngotomy. The case was entirely unsuccessful, but as far as the technique is concerned the operation was accomplished with more ease than it could have been done under the ordinary method. He had removed one or two specimens from the larynx for microscopic examination, under local anaesthesia; but the great advantage of the method is that you can operate under general anaesthesia.

Jackson's instrument has some advantages over Killian's, and the new-shaped handle which Jackson uses is also used in the latest models of the Killian instruments.

DR. THURBER told of his experience with a very short-necked, thick-set, alcoholic individual, where he had attempted to remove a papilloma by the direct method without a preliminary injection of morphine. The patient took the anaesthetic very badly, and with his short, thick neck, it was almost impossible to get the instrument in the larynx, so the attempt was abandoned, and the papilloma was removed by the usual method the following week. He would be glad to know if others had experienced any difficulty with such individuals.

DR. ABRAHAM said that he wished to add a word of praise for Dr. Jackson's tubal speculum. He had experimented with Killian's instrument also but preferred Dr. Jackson's instrument for direct laryngoscopy. He knew of no instrument which would demonstrate the larynx so well as Dr. Jackson's. He had not yet operated upon the larynx with it, but saw no reason why this could not be done to advantage. The instrument is an ideal one.

DR. MCCOY endorsed the views in regard to Jackson's instrument. Replying to Dr. Thurber, he said there might be some difficulty in getting such an individual under the anaesthetic but once under its influence and thoroughly relaxed, there would be no more difficulty with such a case than with any other. It is simply a question of getting the muscles thoroughly relaxed.

Demonstration of Instrument for Opening the Frontal Sinus Through the Nose. By S. YANKAUER, M. D.

Dr. Yankauer demonstrated an instrument for this purpose.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

Twenty-ninth Annual Congress. Washington, D.C., May 7 to 9, 1907.

A. W. DeRoaldes, M. D., President.

(Continued from the June Number, page 512)

A Case of Bilateral Abductor Paralysis of the Larynx. By Charles H. Knight, M. D. (Read by Title).

(*Published in full in* THE LARYNGOSCOPE, *September, 1907, page 685.)*

Ligation of the External Carotid Artery, Considered from a Rhinological and Pharyngological Viewpoint. By Chevalier Jackson, M. D. (Candidates Thesis).

After attributing the belief that this operation is a serious one to the impression created in preaseptic days, the author goes on to give the indication, mortality and technic of the operation, closing with reports of a few illustrative cases and a summary of his thirty-eight cases.

The indications of interest to the rhino-pharyngologist are, severe hemorrhage after tonsillectomy and intra-nasal operations, as a preliminary step in the removal of fibromata and angiomata of the rhino-pharynx, and in malignant disease in the external carotid area, the maxillary antrum, the nose and naso-pharynx.

The mortality taken from all sources is two to three per cent. In Dr. Jackson's thirty-eight cases nil. He attributes this in part to his care to ligate as far as possible above the bifurcation.

For the performance of the operation a few suggestions are offered after reference to the classic description. An ample incision is advised to avoid any risk of mistaking the artery due to an anomalous condition. Local anaesthesia should be used if there is the slightest contra-indication to general anaesthesia.

Crile's operation of temporary compression of the common carotid with this surgeon's elaborate apparatus is discussed, and the advisability of the resection of a portion of the arterial trunk, instead of merely ligating it in malignant cases, is pointed out.

Epithelioma; Total Laryngectomy, Including the Removal of Part of the Trachea; Death from Pneumonia on the Thirteenth Day. By Clement F. Theisen, M.D. (Read by Title).

Before reporting this case the author calls attention to the difficulty of obtaining a reliable pathological diagnosis of malignant disease of the larynx, due in large part to the failure of the surface of the growth to show its true character. This results in delayed operation, and the removal of pieces for examination stimulates the growth.

The operation in this case is described with the accompanying points of interest. The gross and microscopic description of the specimen removed is given in full.

Sarcoma of the Pharynx in a Child of Eight Years, with Autopsy Finding, and Microscopical Report. By CLEMENT F. THEISEN, M. D. (Read by Title).

The author presented the report of this case, because of the rarity of sarcoma of the pharynx in young children.

The growth showed as a large mass, involving the soft palate and pushing it forward. It extended downward almost to the epiglottis, and apparently upward into the naso-pharynx. It was firm to the touch. There was some involvement of the glands, particularly of the left side of the neck.

Coley's serum in increasing doses was used for about a month and a half until the death of the patient. For a few weeks the serum injections seemed to be beneficial.

The description of the post-mortem findings, microscopic and gross, are included, and there are two views of the pathological specimens.

The status of the question of treatment for these cases is briefly considered.

Is There an Ideal Operation for the Correction of Deviations of the Nasal Septum? By JOSEFH C. GIBB, M. D. (Candidate's Thesis).

The various operations are briefly considered, and the final conclusions are reached that:

(1) There is no single operation devised which will correct every form of deviation of the nasal septum.

(2) The shape and positions of the septum resulting from deviation are so various as to make accurate description difficult, if not impossible.

(3) The object of operation upon the septum should be correction sufficient to restore the normal functions of the nose with as little destruction of tissue as possible.

(4) Each case must be a law unto itself, and studied carefully and in its entirety.

(5) In many cases the object sought, namely, restoration of nasal function, may be attained by the removal of exostosis or enchondroses, and the septum left intact.

(6) Other cases may be corrected by one or other of the older operations, the selection of which depends upon the individual preferences of the operator.

(7) Still others can be corrected by removing the septum entire, according to the submucous method.

Erysipelas and Its Relation to Purulent Inflammations of the Nasal and Aural Cavities. By CHRISTIAN R. HOLMES, M.D. (Candidates Thesis).

The rather vague etiology of many streptococcic infections is given as a sufficient cause for careful research into the subject of erysipelas.

The growth of the knowledge of the bacteriology of the subject is traced from the early beliefs up to the present generally accepted statement that the various kinds of streptococci are fundamentally the same and inter-changeable.

A large mass of data has been collected from the literature on the flora of the nose, pharynx and accessory nasal sinuses, and this is given at some length, with the final conclusion that the pneumococcus and streptococcus are the two principal pathogenic bacteria which have their normal habitat in the nose and accessory sinuses.

The author then goes on to connect the relatively frequent occurrence of facial erysipelas with a primary infection in the nose and accessory sinuses. In support of this conclusion he adduces many reports of cases and many authorities. A lengthy bibliography is added.

Large Tumor of the Laryngo-Pharynx Removed by Sub-Hyoid Pharyngotomy. By WALTER F. CHAPPELL, M. D.

This tumor in its course first interfered with respiration, and later deglutition. Its growth was slow, and occasioned remarkably little interference with the general health of the patient. It was removed through a transverse incision below the level of the hyoid and through the thyro-hyoid membrane. The pedicle was attached close to the left ary-epiglottic fold. It was tied off with black silk ligature, which subsequently gave trouble. The author concludes that chromacized gut would have been better. The tumor was smooth, irregular in shape, weighed twenty grams after it had been in formation, and four and one-half inches in circumference.

Subsequent to the operation, aside from some difficulty in feeding, with a slight attack of scorbutus, recovery was uneventful.

Eleven similar cases are reported from the literature. Three excellent illustrations accompany the paper.

The Construction of the Ethmoid Labyrinth. By GEORGE E. SHAMBAUGH, M. D. (Candidate's Thesis).

This paper consists of a critical study of eight sections taken through the ethmoid labyrinth to discover the relation of the cells of the labyrinth to each other, and to the adjoining nasal accessory sinuses and structures. There are eight illustrations showing these relations.

The growths were very numerous, covering the epiglottis, springing from the region of the ventricles, lining the vestibule of the larynx and covering the cords.

Various drugs were tried in vain, as also systematic removal by forceps. New growths continued to reappear. Finally the application of alum and savin in power seemed to check the growths, which were then removed by forceps. The patient used a strong solution of alumnol as a spray, until the last papilloma had been removed. Recovery has been complete.

A Case of Diphtheria of the Skin of Three Years' Duration Treated by Anti=Toxin. A. B. SLATER, *Lancet*, Jan. 4, 1908.

There seems to be no doubt that the most important factor in this case was the Klebs-Loffler bacillus. The disease apparently commenced as an acute attack of diphtheria, the primary seat of infection being the eyes. From this focus the vulva became infected, and then the bacteria in some way found their way into the superficial lymphatic circulation, producing a condition resembling herpes, probably as the result of peripheral neuritis set up by the bacilli themselves. This theory is based on the fact that during the whole of the duration of the disease, since the primary acute symptoms, the lesions have been confined to the superficial layers of the skin (proved by the fact that no scarring was left). Whether the staphylococci played any important part is difficult to say, but they probably had only a mild influence, if any at all, as the use of various lotions, such as one in 40 carbolic lotion, and perchloride of mercury one in 1,500, had no effect on the lesions, whereas the effect of the antitoxin was remarkable. THOMSON.

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

CONTOUR AND CONTENTS OF THE EPITYMPANUM IN RELATION TO SUPPURATIVE DISEASE.*

BY CLARENCE JOHN BLAKE, M. D., BOSTON, MASS.

The epitympanum while varying greatly in size and shape in different individuals, still possesses certain uniform characteristics which are a guide in the determination of the nature of remedial measures, applicable to diseased conditions of its contents.

For purposes of classification the epitympanum proper may be regarded as a very nearly circular cavity slightly compressed from within outward, and from below upward, its major portion lying posteriorly to the median vertical line of the tympanic cavity, and its walls, in contradistinction to the floor of the tympanum, and the inner wall of the aditus ad antrum mastoideum, being of a smooth and even contour.

The downward and inward slope of the outer epitympanic wall serves to make the bony portion of the epitympanic floor, the remaining space between this and the opposite tympanic wall being partly filled in by the upper surface of the short process of the malleus and the attachments between this bone, the incus, and the outer epitympanic wall, and bridged over by the folds of mucous membrane, with occasionally interposed laminae of fibrous tissue, which are found, to a greater or less degree, in more than 85 per cent. of normal human temporal bones.[1]

It is this main cavity of the epitympanum which is the most constant in its position, size and outline, the greatest variations

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(1) Reduplications of mucous membrane in the upper portion of the tympanic cavity. Boston Med. & Surg. Jour., May 30th, 1889, 531. C. J. Blake and W. S. Bryant.

*Read before the meeting of the Eastern Section of the American Laryngological, Rhinological and Otological Society.

being those which concern the extensions from this cavity backward and upward in the form of varying recesses in, or encroachments upon, the surrounding diploetic space.

In some instances these encroachments leave a multiple layer of diploetic cells between the tympanum and the superficial cortex of the temporal bone, either inward toward the pyramid, upward toward the tegmen tympani, or backward toward the mastoid, while in still other cases the recesses, apparently joining in the formation of one large pneumatic space, have made the outer cortical layer the only boundary between themselves and the cranial cavity.

With such diversity of contour and such variety in approximation of the superior epitympanic space to the cranial cavity, the question of the speedy outcome of a suppurative process in the epitympanum, in so far as its lethal extension is concerned, would seem to be a matter of considerable dubiety.

It is not, however, until the contents of the epitympanum is made the subject of a careful study, and the possible protective limitation afforded to the progress of a suppurative process is appreciated, that an assurance is apparent, the knowledge of which can be utilized in the prolonged treatment of epitympanic suppuration.

The central, circular, portion of the epitympanum enclosing the larger portions of the major ossicles, bounded posteriorly by the extremity of the recessus incudis and inferiorly by ligamentous attachments and supplementary ligamentous bands, with the addition of mucous folds, becomes almost a cavity by itself, its limited means of communication, with the adjacent parts of the tympanic cavity, being speedily closed in the event of engorgement of the lining membrane.

This engorgement of the mucous, and submucous, tissue, forming the lining of the tympanic cavity throughout, varies greatly in different parts of the cavity and is demonstrable in cases of large perforation, or destruction, of the drum-head, and in cases of destruction of the outer epitympanic wall, the known vascularity of the lining membrance of the upper and posterior portion of the epitympanum favoring a rapidity and persistence of engorgement sufficient not only to compress the retained air in the lower portion of the tympanum and press the drum-head outward, but also to afford a prolonged closure of the aditus and thus still more effectively comprise the epitympanum of pathologic causation, within the boundary limit, of what may, anatomically, be called the epitympanum proper, the constant space factor, in contradistinction to the extremely variable, and therefore inconstant, space factor beyond it.

Within such an encapsulation a congestive or suppurative process may run its course, its apical outlet being outward and downward through the pars flaccida or through the posterior portion of the outer boundary of the epitympanic space, into the tissues of the upper portion of the membrana vibrans, the remaining portions of the tympanic cavity remaining untouched. Examples of this are to be found in the cases of free serous exudation through the upper portion of the drum-head, accompanying acute congestion, and in the cases in which a carious process of the head of the malleus has run its course to destruction without lateral, or inferior, extension of the suppuration, or other drainage than that afforded by the opening in the pars flaccida. In the initial congestive stage the swelling of the mucous folds, and of the constant mucosa of the aditus, tends to protect not only the underlying diploe, there so extensively present, but to block the major passage backward into the mastoid through the pneumatic chain, of which the epitympanum is the initial member, while in the more advanced suppuration not only the engorgement, but also the proliferative swelling of the soft tissues, serve the uses of limitative protection, and, even where a carious process has been initiated in the major ossicles, or on the outer epitympanic wall, the tendency is to wall the area off from the surrounding healthy structures by engorgement, proliferation, or the production of reparative granulomata.

Examination of the supplementary ligamentous attachments of the ossicles, as well as of the epitympanic mucous folds, shows a tendency to favor drainage of the epitympanum, outward either over the incline of the short process of the malleus or through the posterior portion of the membrana vibrans, in its upper segment, the anterior rounded border of the epitympanic space being above the incline of the tympano-pharyngeal tube and its posterior, antral, portion terminating on a line with the porterior border of the recessus incudis.

The horizontal folds are usually two, sometimes three, in number, one stretches from the anterior border of the tensor tympani tendon forwards and outwards, attaching itself to the anterior ligament of the malleus, and to the anterior wall of the tympanum just above the entrance to the tympano-pharyngeal tube. Another fold covers over the space between the external ligament of the malleus, the posterior ligament of the incus, the incus, and the external tympanic wall. The least common horizontal fold stretches between the long and the short processes of the incus, the posterior crus of the stapes, and the inner wall of the tympanum.

The vertical folds may be considered as two in number, both suspended from the tegmen tympani; one stretching between the anterior and the suspensory ligament and the other between the suspensory and the external ligament of the malleus. The latter fold is often V-shaped, one arm joining the external ligament, the other arm going obliquely outwards and downwards, joining a horizontal fold near the base of the short process of the incus.

Attached to the posterior side of the suspensory ligament is sometimes found a falciform fold, stretching from the articulation of the malleus and incus, backwards and upwards, onto the tegmen tympani.

The space above the pars flaccida is especially rich in mucous folds. These fill the spaces between the ligaments of the malleus in such a way that there is usually enclosed an irregular pyramidal space with its apex at the suspensory ligament of the malleus. This space is bounded below by the malleus, the pars flaccida, and the external epitympanic wall; above by the soft tissues and mucous reduplications below the tegmen tympani; externally by the upper portion of the outer tympanic wall, and internally by the head, and the anterior ligament of the malleus, and by the vertical fold of membrane stretching between the anterior and suspensory ligaments of the malleus; while it is bounded posteriorly by the external ligament of the malleus and the vertical mucous fold between this and the suspensory ligament.

This space is lined with mucous membrane and often crossed by mucous folds; at its lowest point the pars flaccida meets the short process of the malleus on its upper surface, so that fluid within this space gravitates onto the lower part of the pars flaccida.

The results of the examinations of temporal bones show that in 85 per cent. the space immediately above the pars flaccida is almost wholly enclosed by mucous folds, while in 77 per cent. the epitympanum is partially cut off from the tympanic cavity below it by mucous folds stretching across at least one-half the space.

These enumerated folds, moreover, do not include the reduplications partially bridging recesses in the superior epitympanic space and encroaching upon the lumen of the antrum, folds which, with the more constant mucous reduplications proper, may be safely estimated as more than doubling the vascular surface of the tympanic cavity as a whole.

Investigation, either by section or by transillumination, of the bony wall forming the outer and, partly, the inferior wall of the epitympanum, and coincidently the inner end of the superior wall of the bony external auditory canal shows the reason for the comparative frequency of the spontaneous destruction of this portion of the epitympanic wall in the course of a prolonged suppuration in the epitympanum, with osseous necrosis, where the encapsulating soft structures, engorged and often adherent, have limited extension of the suppuration upward and facilitated the bony destruction downward which most favors the enlargement of the drainage exit from that important direction the posterior extension of the epitympanic space.

In cases of caries of the head and neck of the malleus the destruction of the pars flaccida, and in carious implication of the incus, perforation of the posterior segment of the membrana vibrans, may afford, in themselves, adequate openings both for drainage and for surgical approach, but both drainage and repair may need to be further facilitated by the division of mucous folds and of pathologic adhesions within the area which constitutes the epitympanum proper, as distinguished from the surrounding epitympanic space, and a necessary preliminary to a successful treatment of a limited necrosis within the epitympanum may be not only the removal, by morcellative curettage, or by dry scrubbing, of redundant obstructive granulomata but also the division of folds and bands between the major ossicula and the outer epitympanic wall. This may be easily done by means of the usual angular middle-ear knives, by the curved spatula knife or by the broad bladed mirror knife, cutting being preferable to tearing with a blunt instrument, a ring curette for example, on account of the lesser liability to denudation of bony surfaces still protected and nourished by their normal soft tissues.

The not infrequent clinical presentation of the results of an old suppurative middle ear process, with the membrana vibrans intact, or showing a conglutinate posterior perforation, with an opening above the short process of the malleus, including a portion of the bony outer epitympanic wall, bounded by involuted cicatrices, dry, clear of congestion and with a fair amount of hearing, is an indication, in what nature has spontaneously effected, of an advisable course of surgical procedure, sufficiently prolonged and patiently pursued.

In the light of structural study and clinical experience the differentiation between the cases of epitympanic suppuration which may be safely treated through the natural channel and those demanding the creation of a new avenue of approach, should be most carefully made and determination should be based upon the merits of the individual case and not upon any merely chronometric estimate.

226 Marlborough St.

A Recent Development of the Radical Mastoid Operation. LOCKHART GIBSON. *Australasian Medical Gazette*, Nov., 1907.

The author gives a short résumé of the stages of evolution of the Radical Mastoid Operation, ending with that latest proposal of Charles Heath of London. Heath's procedure, which, in suitable cases, aims at leaving the drum and ossicles, as well as the bridge of bone over the additus-ad-antrum has his unqualified approval, but he thinks Heath's probes to be needless, even when there is no drum membrane to preserve. And burrs are preferred to chisels and hammer.

Where, however, the ossicles are necrosed, or the walls of the tympanum necrotic, or when the ossicles are bunched up with the remains of the drum in such a way as to be obstructive to the conduction of sound, the thorough and complete Radical Operation must be performed, and in these cases he strongly advises that the after healing be shortened by using Ballance's method of skin-grafting. He makes the statement that after a Ballance operation we may expect the patient to hear up to eight yards, distinct-speech, and that is a successful operation. With presentation of drum and ossicles, we may expect anything up to practically normal hearing.

NOLAN.

THE SIMULATION OF MASTOID DISEASE BY FURUNCLE OF THE EXTERNAL MEATUS AND PERI AURICULAR ABSCESS*

BY H. GRADLE, M. D., CHICAGO.

The diagnosis of furuncles of the external meatus is, as a rule, perfectly plain. There are, however, exceptional instances in which a small boil does not project above the surface. If at the same time there is much pain and swelling over the mastoid process a diagnostic error may occur. The resemblance to disease of the mastoid process is even greater in peri-auricular abscess when there is a collection of pus between the cartilaginous meatus and the antero-external surface of the mastoid bone. These abscesses which have been but little described, may result from the extension of a furuncle or of a diffuse otitis externa. In one of my cases the post mortem showed the abscess to be of peri-tonsillar origin. In some instances the etiology is not clear.

Leutert, (*Arch. f. Ohrenheilk,* 1897, Vol. 43, p. 267), who first called attention to these diagnostic difficulties, laid some stress on the type of fever accompanying peri-auricular abscess not of mastoid origin. In three instances, he found the fever higher and more persistent than is ordinarily the case in subperiosteal mastoid abscesses, while its persistence for a few days after a free incision helps to differentiate the superficial affection from a peri-sinuous suppuration (without thrombosis). For in the latter form of disease Leutert claims an immediate lowering of the temperature after free escape of the pus. Leutert's cases were pus collection secondary to furuncles and contained necrotic tissue shreds, which probably accounted for the degree and persistence of the fever.

More recently attention has again been called to the subject by G. Connal, (*Brit. Med. Jour.,* May 25, 1901, p. 1264). He reports two cases with photographic illustrations showing how post-auricular swelling simulating mastoid periostitis can be caused by furuncles in the meatus and disappear after their incision. His description, however, applies to a peri-auricular abscess.

The following personal observations illustrate some of the diagnostic difficulties which furuncles of the meatus and peri-auricular abscesses may present in exceptional instances. Their detailed description will render further comments unnecessary.

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*Read before the meeting of the Chicago Laryngological and Otological Society, April 14th, 1908.

Case 1. Mr. L., a healthy laboring man, came to the dispensary of the Northwestern University Medical School with the appearance of acute mastoiditis. Three days ago he began complaining of a dull pain behind the right ear, followed by increasing swelling. There had been no history of previous ear disease. The hearing was slightly dulled and the ear felt stuffy. The pain was a dull ache, with great tenderness, but without headache. The auricle stood at nearly a right angle to the side of the face. The mastoid region was very oedematous, but only moderately reddened. The retro-auricular groove was effaced. The swollen region was tender to touch. The meatus was somewhat narrowed by diffuse swelling principally of the posterior wall, however, without redness. The drumhead was pale and normal. His general health was not much disturbed, his tongue slightly coated. The temperature at the time was 101° F.

On presenting him to the class, I pointed out that while he showed the appearance of either a subperiosteal abscess over the mastoid, or a perforating mastoid empyema, that such a diagnosis was not sustained by the history. In the absence of previous middle ear disease an acute mastoid inflammation would be of the nature of an osteomyelitis, more slow in development, and with more intense local pain and more pronounced systemic disturbance. The rapid development and relatively slight disturbance pointed to a more superficial affection, which I took to be an abscess in the areolar tissue between the cartilaginous meatus and the meatus and the mastoid periosteum secondary to an otitis externa. There was no localized swelling indicative of a furuncle.

Carbolated glycerin was instilled for the day. When he returned the following day the abscess had opened spontaneously on the posterior wall of the meatus far inward with free discharge of pus. There was subjective relief and considerably lessening of the swelling. Under a gauze dressing in the meatus complete recovery took place in three days.

Case 2. Miss M., a deaf mute 35 years of age, is said to have lost her hearing during early childhood in consequence of scarlet fever. The lesion was probably an inflammatory destruction of both labyrinths. Both drumheads presented a cloudy and puckered appearance. No details could be learned regarding the former existence of dizziness. As far as she could remember, she had never had any aural symptoms. On account of toothache, she had had the left upper eye tooth extracted. One or two days later pain began in the left side of the face, extending into and behind the ear. For a few days she was treated for facial neuralgia and as there was no improvement she entered the Wesley Hospital.

When I saw her it was ten days since the extraction of the tooth, and about one week since her pain had begun. The latter had increased steadily in severity, had kept her awake part of the nights, and had necessitated the use of morphine. It was, however, not continuous, but remitting irregularly, and sometimes nearly absent for a short time. It was, localized mainly underneath the meatus and in the mastoid region, but radiated towards the cheek. With it there was some headache, both diffuse, and more especially localized on the left side. It was, however, difficult to get any accurate description from the mute and reserved patient by writing.

The patient felt sick and tired out. Her temperature fluctuated between 99½ and 100° F. The tongue was heavily coated and the breath offensive. These buccal symptoms were probably due mainly to a diffuse pyorrhea alveolaris—presumably of long standing. Nothing abnormal was found in the socket of the extracted tooth. There was no swelling around or behind the ear, but excessive tenderness to touch over the entire mastoid region, as well as underneath the meatus. The sensitiveness extended beyond the mastoid to the occipital bone, and anteriorly beyond the auricle. The symptom most suggestive of mastoid involvement was decided pain on percussing the bone over a distance of several centimeters above and behind the ear. The meatus was not narrowed. About in the middle of the posterior-inferior wall the tenderness to touch by the probe was most pronounced. Yet there was not enough prominence there or anywhere to recognize a furuncle in the walls of the meatus. The puckered and cloudy drumhead was pale. She complained of no unnatural feeling in the ear itself.

Apart from the pain and extensive tenderness there was nothing in the history or symptoms to sustain the diagnosis of mastoiditis which had been made prior to my visit. My own suspicion of a deep furuncle in the meatus was, however, not borne out by examination. On finishing the examination by exploration of the nose and throat another diagnostic puzzle came up. There was pus in the middle nasal meatus of the affected (left) side, and the immediate suggestion of a maxillary empyema was confirmed on finding the left cheek dark on translumination. It could not be learned from the patient whether the nasal suppuration was of recent date or of long standing, as it evidently had not annoyed her. The left side of the nose, was, however, less patent than normally. The socket of the extracted tooth did not communicate with the antrum.

While I have seen both extensively radiating as well as abnormally located pain in connection with maxillary empyema, it did not seem probable that the maxillary disease could account for the pain, and more especially for the tenderness behind the ear. Carbolated glycerine (10 per cent) was instilled into the meatus and retained by cotton. Antipyrin relieved the pain considerably during the night.

The next day it was found that a furuncle had opened on the posterior wall of the meatus, giving exit to a drop of thick pus. Under a gauze tampon the trifling discharge ceased in four days, and the temperature became gradually normal. The pain subsided slowly, but steadily, being now easily controlled by an occasional dose of antipyrin, but it took several days for the tenderness and pain to cease entirely, even after the furuncle discharge had stopped. The patient declined treatment of the maxillary empyema. All discomfort had left her after the end of the first week in the hospital. Her recovery was permanent.

Case 3. Mr. Z., 30 years old, has had chronic discharge from the right ear since infancy. The drumhead and ossicles are entirely absent, and the hearing is quite dull. Under proper treatment the discharge has always lost its odor quickly and disappeared in the course of weeks or months. But relapses of suppuration have always recurred after an interval of a few years at the longest. The patient having again been cured by me three years ago had staid so for perhaps two years. Since a number of months the discharge had returned, and had been kept under control by the patient himself by means of gauze drains. Since a few days increasing pain around the right ear.

The walls of the meatus were swollen so that no view of the interior could be obtained through the smallest speculum. There was scant purulent discharge with slight fetor. Oedema, with very little redness over the mastoid region. The patient, an extreme neurasthenic, complained of intense tenderness all around the ear. His temperature ranged around 100 to 101° F.

Under the use of carbolated glycerin and firm tamponing with gauze, the inflammatory swelling of the meatus receded moderately. Irrigation through a fine canula brought out no detritus or inspissated pus. As the swelling over the mastoid increased, I made a Wilde's incision on the fourth day under gas on the assumption that this was a peri-auricular abscess. No pus was reached. Three days later the abscess seemed to point in front and just below the meatus. I incised again deeply, but without reaching pus. The pain and distress and temperature had all increased, (the latter up to 103° F). Two days afterwards the abscess opened itself at the external end of the anterior wall of the meatus internal to the tragus. As the symptoms did not subside very rapidly, I enlarged the small spontaneous opening on the next day, whereupon a more decided improvement began. After some ten days the wound had closed, and there was only the scant discharge from the middle ear. But the patient's comfort was again interrupted by acute symptoms with pointing of another abscess over the ramus of the jaw below the meatus. A free incision liberated a few c. c. of pus, and within two weeks everything had disappeared except the persisting slight discharge from the middle ear. The recovery was probably hastened by the injection of staphylococcus vaccine, in view of the staphyloccus found in the pus. The injection was repeated once after an interval of a week. During the following six months the patient had no further annoyance, beyond the slight inodorous discharge from the middle ear.

Case 4. Mr. G., 72 years of age, had previously been under my treatment for marginal keratitis. His health was fair, but the low specific gravity of the urine and slight albuminuria indicated interstitial nephritis. In September, 1894, he complained suddenly of left earache. The pain shifted the next day more towards the side of the neck and the mastoid region. It was not intense, but was accompanied by left sided headache. The third day the pain was mentioned but little by the patient, who was becoming somnolent at intervals. Dr. L. L. McArthur was called in and asked me in consultation that evening. The patient was fast sinking into a depressed condition, being drowsy most of the time. Temperature flutuated between 102 and 103° F. Pulse fast and weak. The patient, when roused, claimed he had neither pain nor headache.

There was a phlegmonous swelling from the region of the parotid gland, extending down the side of the neck a few centimeters below the tip of the mastoid, effacing the retro-auricular groove. The lateral surface over the mastoid was normal, but tender to touch. The meatus was absolutely closed by swelling, and hence the hearing very much dulled in that ear. The left tonsil, pushed inward towards the median line, was pale, but surrounded by oedema.

We concluded that there must be pus in the depth of the soft tissues, without involvement of the bone.

On account of increasing symptoms, Dr. McArthur made a Wilde's incision the following day, liberating pus freely.

There being no improvement, we explored more fully the following day under a very light chloroform anesthesia. There was now an enormous flow of pus from the meatus, which we traced to a sinus in the lower wall leading to an abscess beneath. This was opened freely and packed. The patient did not rally and died the following morning.

The autopsy limited to the exploration of the abscess showed that this originated external to the tonsil, and had penetrated toward and behind the ramus of the jaw. It had burrowed both upward and downward, and had penetrated the lower wall of the meatus between the bony and cartilaginous portions. The mastoid bone, its antrum, and the middle ear, were found healthy.

100 State street.

Laryngeal and Pulmonary Syphilis; Elimination of a Necrosed Arytenoid; Cure. Dr. Ranjard, de Tours. *Bull. de Laryngol., d'Otol., et de Rhinol.*, Oct., 1906.

The author reports an interesting history of a patient, whose laryngeal lesions, as well as general conditions and family history, suggested tuberculosis. The discharge of a necrosed arytenoid suggested the advisability of placing the patient on antisyphilitic treatment. This resulted in a rapid recovery not only of the larynx, but also of the pulmonary affection. Scheppegrell.

TREATMENT OF SUPPURATION OF THE TEMPORAL BONE OTHER THAN SURGICAL.*

BY GEO. F. KEIPER, A. M., M. D., LAFAYETTE, IND.

That all cases of suppuration of the temporal bone, especially all cases of what we commonly know as mastoiditis, do not need either the simple or radical mastoid operation, goes without saying. In fact, many such cases are cured without such operation. But do not construe this to mean that because many are so cured, all ought to be. They won't.

At the outset let us understand that some of the cases which we see are in such condition that any attempt at other than immediate operation is a reckless waste of time, both for physician and patient. But on seeing a case upon which, after careful examination, we decide not to resort to operation, at least for the present, the question arises, what shall we do?

We shall dismiss that very rare affection, primary periostitis of the temporal bone, and confine ourselves to the treatment of middle ear suppuration, whether acute or chronic, and mastoiditis.

Some general principles of procedure ought to be laid down to cover all these conditions:—

First—The patient demands a thorough examination, both locally and generally. A full history of the case will be necessary. This will determine the general condition. The general condition is of great importance, not only with reference to the cause of the disease, but also with reference to the extension of the disease to other tissues of the body distant from the seat of the primary focus. I have seen cases where suppuration in the temporal bone showed itself elsewhere. A recent case in St. Elizabeth Hospital, this city, had synovitis of the right knee joint, due to pus in the temporal bone.

Second—The physician must always keep in close touch with the patient.

Third—A blood count is of great value to determine, first of all, the number of white cells and the relative proportion of the polymorpho-nuclears; second, the number of red cells, and lastly, the percentage of hemoglobin. This should be made frequently during the progress of the disease.

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*Read at the meeting of Middle Section of the American Laryngological, Otological and Rhinological Society, Indianapolis, Ind., Feb. 22, 1908.

Fourth—The microscope must be further used to determine the character of the pus, especially as to the bacteria present therein. For if we find pneumococci, we may feel encouraged to try abortive treatment. The figures of Cunningham, while house surgeon at the New York Eye and Ear Infirmary, show that 90 per cent of cases with pneumococci in the aural discharge recovered without operation, and a mixed infection without streptococci allowed 66 2-3 per cent of recoveries, without operation.

This is quite in contrast with pus showing streptococci; wherein only 14 per cent recovered without operation, and with pus showing staphylococci, there were only 33 per cent recoveries without operation, while a mixed infection with streptococci, only 8 per cent recovered without operation. The rest required operation.

"Under pneumococcus," writes Dench, "are included those cases in which the infective organism was a diplococcus resembling closely the pneumococcus, but not of sufficiently definite character to state positively that they were true pneumococci."

In other words, the examination of the blood to determine the leucocytosis, and of the pus of the ear to determine its bacteriology are essential prerequisites that we may know approximately, if our case has a prospect for recovery with or without operation. The results of the examinations should be communicated, either to the patient, his or her family, or nearest friends or relatives.

Fifth—The pus should be examined for bone dust for that indicates caries.

In otitis media suppurativa acute, the first essential is to secure good drainage through the external auditory canal. If the drumhead is not ruptured, the cause of good drainage will be best served by a free incision in the drum-head posterior to the mallens handle. This will not only relieve pain, but will prevent pus being dammed back into the mastoid antrum to produce necrosis by pressure. Again the nice clean incision will promptly heal, after the pus has ceased to flow, whereas, if nature, after intense suffering to the patient, ruptures the drum, an irregular opening will be produced, which may never heal, besides causing unnecessary deafness to the patient. Then drainage is best secured by the gauze wick carried right down to the perforation. To complete the dressing, the external ear is covered with an absorptive dressing in the shape of a pad of absorbent cotton. When the gauze wick is saturated with pus, it must be removed, the ear syringed and dried, and insufflated with boric acid powder. Then a new gauze wick is introduced, as was the first one. The pus in the middle ear should have been previously aspirated, not Politzerized.

If pain persists, the application of heat will be very agreeable, preferably by the Japanese pocket stove, which, when properly lighted, will maintain heat evenly for two hours, the degree of which may be regulated by the amount of wrapping around the instrument. This should be tied on the head over the ear. This is better and handier than the Leiter Coil, or the hot water bottle. Morphia should be used cautiously.

The best place for the patient is in bed, in a sunny, warm room, which is well ventilated and clean. The bowels should be opened after this fashion, if the patient be an adult:

℞ Hydrarg. Chlor. Mitis ....gr. ii
Quininæ Sulph ....gr. xviii
M. Ft. cap No. vi.

Sig.: One every three hours until the bowels move. If they do not move within two hours after the last one is taken, then a dose of sulphate of soda or sulphate of magnesium is indicated.

The above will be modified as to dosage according to the age of a child when used on a child.

Attention to the nose and naso-pharynx will also be necessary, and if the patient be suffering from acute rhinitis, the application once daily to the nasal mucous membrane of a solution of the following will be valuable:

℞ Iodin ....gr. v
Potass. Iodidi ....gr. xv
Glycerin ....oz i
M. (Gleason.)

The treatment of Otitis Media Purulentia Chronica will vary with the cause, which may be local or general, or both. If general, it may be due to anaemia, tuberculosis, scrofula, syphilis or la grippe. If local, the discharge may be due to abscess of the external auditory meatus, but most frequently to inflammation of the middle ear and mastoid cells, and less so to polypi.

Hence for constitutional treatment, iron will be indicated for the anaemic; potassium iodide in large doses, and mercury for the syphilitic; for the emaciated quinine and sodium salicylate; for the tuberculous, sunshine and fresh air; nourishing food, with cod liver oil and creosote, and for all, exercise in the open when possible.

For local treatment, the first thing is cleanliness, secured by judicious syringing, with warm, sterile water, followed by careful drying of the parts. If polypi are present, remove; if granulations, use warm alcohol in the external auditory meatus. The warm alcohol is a good cleaning agent in any event. It may be forced into the middle ear by pressing the tragus into the canal completely filled with the alcohol. If the perforation be in syringe point introduced through the perforation. Peroxide of hydrogen should be carefully used, and used only on the applicator to soften and loosen crusts in the external canal. The drying of the parts may be secured by heated air. Powdered boric acid may be blown into the ear, but not in sufficient quantity to obstruct the canal. Richards recommends pyoktanin (one part in nine parts of boric acid), as an insufflating powder, and it seems in the writer's hands to do all claimed for it by its author, though it does discolor the ear and adjacent parts a deep purple, which is sometimes hard to remove even by alcohol.

Again we may use the gauze wick, as in acute suppuration, but with care, for many cases do better with the dry treatment with boric acid powder.

As to drops, the best remedy to use in the middle ear is nitrate of silver in solutions of varying strengths. D. A. Kuyk of Richmond recommends, beginning with a six per cent solution, gradually increased to a 25 per cent solution, to be forced into the innermost recesses of the ear by the Siegel otoscope (Journal A. M. A., 1905.)

For acute mastoiditis, the first essential is free drainage. If the hole in the drum is not large enough, enlarge it by a Graefe cataract knife. If pain is present, relief will be most grateful. It will be best to aspirate the pus, instead of blowing it out by the Politzer method, though by Politzerization, the ear can hardly be more infected than it is. Free drainage will be promoted by the use of the gauze wick as above. The patient should be put to bed and kept there until symptoms have subsided. The writer is partial to the application of two Swedish leeches to the mastoid process, early in the disease. The writer has always preferred heat by means of the Japanese pocket stove. There has been some controversy as to the relative merits of heat and cold, as local applications in this disease; but to my mind, consideration of the Principles of Surgery, which are the principles of all surgery, local as well as general, settles that point. Cold certainly contracts

Shrapnell's membrane, the syringing must be done with a delicate dilated inflamed blood vessels, but while doing so, locks up in the tissues the bacteria of suppuration present, and does even more harm by reducing the vitality of the parts. The worst cases of abscesses of the brain seen and operated upon by the writer have been those where cold was used as a local application. Note further, that cold is advised to be used only twenty-four to forty-eight hours. What we want in these cases is not stasis, but diapedesis, and as McGuire (*Virginia Medical Semi-Monthly,* Nov. 4, 1900) writes in his "Principles of Surgery," heat acts by soothing the sensory nerves, thus diminishing pain; by drawing blood to the surface, thus acting as a derivative; by favoring of collateral circulation, thus relieving stasis and by liquefying exudation and hastening either its absorption or conversion into pus."

The preference is for the Japanese pocket stove applied day and night, until symptoms abate, or until no apparent improvement ensues. There is no indications for removing it after forty-eight hours, as in the case of cold.

Morphine is contra-indicated, because it masks the symptoms so that it becomes impossible to tell whether the patient has local tenderness. It produces a false security, which leads the patient to believe himself better when he may be worse. The heat will, in the great majority of cases relieve the pain and tenderness. For sleeplessness, chloral hydrate and bromide of potassium or sodium may be used.

Blisters are inadmissable, because they make careful examination of the mastoid process impossible, because the blistered surface feels painful when touched.

Of course these patients do better in bed in a well ventilated, clean room, bright and cheery from direct sunlight.

The bowels must be opened by the calomel purge outlined above. The treatment for the general condition will vary as to the cause, whether it be the exanthemata or la grippe. The temperature and pulse must be taken every three hours and recorded, for this may be the only way we have of diagnosing sinus involvement.

As to the use of the antistreptococcic serum, my experience has been that any case severe enough to warrant its use needs a mastoid operation worse than an injection of the serum.

In chronic mastoiditis, like chronic appendicitis, no treatment seems to be of value save the radical or the meato-mastoid operation.

THE DIAGNOSTIC VALUE OF SYMPTOMS OF THE UPPER AIR TRACT IN RHEUMATISM, GOUT AND DIABETES.*

BY EMIL MAYER, M. D., NEW YORK.

The first and most important relation of the upper air tract in rheumatism is the etiological factor. It is now generally accepted that rheumatism is a disease of the infectious type and that some form of streptococcus is responsible, and there is practical unanimity also that entrance into the system is obtained by way of the mouth through some part of the Waldeyer ring.

The manner of entry is graphically described. The bacteria of health find themselves strongly entrenched in the tonsillar tissue of the ring, faucial, pharyngeal or lingual. The mouth is the "clubhouse" for all sorts of disease germs, streptococci seeking admission. Here is the forkway of food and air, and here, too, are the crypts in the tonsillar tissue where the enemy may become lodged The health germs fight valiantly to throw off the septic ones, and succeed usually, unless reinforcements arrive for the enemy and somewhere a denuding of the epithelium takes place, when a portal of entry is found, the lymph spaces are entered, then the glands. and infection ensues.

Regarding the precise point of infection, there is a difference of opinion, and as the possible prevention of infectious diseases is at issue, it is of the utmost importance that these differences should be here considered by the clinician who sees the acute rheumatism and the acute endocarditis, and the laryngologist who may see the starting point of the infection.

The pharyngeal tonsil has been most thoroughly and exhaustively studied both from a pathological as well as from the clinician's standpoint. Of our own pathologists, Jonathan Wright,[1], J. L. Goodale,[2] and George B. Wood[3] have contributed freely. While among the clinicians there are among our own authors H. A. Hare,[4] C. G. Kerley,[5] P. Marvel,[6] Isaac Adler,[7] K. K. Wheelock[8], A. Jacobi,[9] with a host of others the world over.

Of the recent writers there is an interesting resume by F. Kleiminger,[10] on the significance of the tonsils for the occurrence of the so-called cryptogenetic diseases:

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*Being a part of a symposium on this subject presented before the New York Academy of Medicine, April 2nd, 1908.

General affections occurred independent of tonsils in seven per cent of cases. In eighty-three per cent the tonsils caused the general infection.

A. There was a tonsillar inflammation in thirty-five per cent of cases of rheumatism and gout, in forty-two per cent of cases of nephritis, in forty-five per cent of cases of other affections; that is, in forty-one per cent of all streptococcus infections.

Of these the tonsils were in fifty per cent subnormal in size, in forty-three per cent hypertrophied, and in seven per cent otherwise abnormal.

B. Previously existing tonsillar infection with inflammation was found in twenty-two per cent of cases of polyarthritis, in twenty-five per cent of nephritis, and in thirty-three per cent of other affections; that is, twenty-seven per cent of known streptococcus infections.

Of these tonsils showing a previously diseased condition, forty-three per cent were subnormal, forty-five per cent were hypertrophied and thirteen per cent otherwise abnormal.

C. Tonsils not previously infected, though the infection entered by the mouth: In thirty-five per cent of rheumatic joints; in thirty-three per cent of nephritis, and in twenty-two per cent of other conditions. Of these the tonsils were subnormal in seventy-five per cent, in eight per cent hypertrophied, while seventeen were normal in size.

"We must therefore be guarded in our prognosis in the anginas with small tonsils. Inquiry should be made as to previous tonsillar inflammation, and if this exists the prognosis should be guarded. Tonsillotomy should be performed in cases of threatened dyspnea, or when malignant growths occur. Its performance removes an important protector against bacterial invasion."

Charles S. Kiefer[11] on the relation between Tonsillitis and Acute Articular Rheumatism, with particular reference to the Prophylaxis of Post-Anginal Rheumatism, says: "We must differentiate between the cases in which the tonsils are the portals of infection in which rheumatism occurred after an incubation period, and those in which, as is occasionally noticed, the tonsillar disease is a complication of rheumatic arthritis."

In 276 cases of rheumatism, 21.3 per cent had a previous tonsillitis, the period of incubation averaged twenty-nine days; treatment consisted in full doses of saturated solution of bicarbonate of soda and local applications of dry aspirin. The immediate results were very satisfactory, redness and swelling disappeared rapidly and after twenty hours the patient was well. In two series, sixty patients were treated by this method and as many others with guaiac, tincture of iron and peroxide of hydrogen. In the latter series the duration of the disease was six days, a number had swollen necks and severe general disturbance. Superficial and deep ulcerations of the tonsils were frequent, and in fifteen per cent rheumatism of the joints ensued. In the series treated with aspirin, the average duration was three days. The spread of the affection was much less, there was no general disturbance and no ulceration of tonsils and in no case was the joint affected.

R. C. Brown[12] (The Relation of the Tonsil to Infection and Infectious Diseases), has a most interesting study on this subject. He says:

"Rheumatim is so frequently preceded by tonsillitis that it seems to be a question if there is a specific germ for rheumatism. The soluble poisons or toxins of several different bacteria may, on account of faulty elimination be deposited in the joint membranes and causes arthritis. It is very probable that the tonsil is more bactericidal in its defensive action than it is antitoxic. This would account for the large number of cases of infection which are due to the faulty elimination of soluble poisons.

"The tonsil is anatomically admirably arranged to resist infection: it is continually exposed to the action of pathogenic germs. When we have an inflammation of the tonsil it is caused by a pathogenic germ which is endeavoring to enter, and the inflammation itself is essentially a defensive reaction. When the resistance is lowered from any cause or the germs are virulent enough to overcome the other means of defense which the tonsil has in common with the rest of the oral mucous membrane, or if the tonsil is wounded, a positive chemotaxis having been produced, there is a lacunar tonsillitis. When a negative chemotaxis is produced, either on account of the virulence of the infection, or from some other unknown cause, there is a general systemic infection without a tonsillitis. When we do have a systemic infection it is either in spite of the defensive reaction, or on account of negative chemotaxis. Finally, the relation of the tonsil to infection and infectious disease is one of protection, and the disease we call lacunar tonsillitis is an example of phagocytosis and is a defensive reaction."

Joseph L. Goodale (Some Considerations Relative to systematic Infection Through the Tonsillar Ring), says: "Our knowledge of the pathology of the faucial tonsils would render it probable on theoretical grounds, that these structures constitute the most frequent portal of entry of all the pharyngeal tissues. This hypothesis has been confirmed by the post-operative results of a certain percentage of cases." In the history of a case presented by the writer there seems a reasonable ground for assuming that after-extirpation of the tonsils, infection of the joints occurred through the lymphoid structures of the posterior pharyngeal wall. It is a familiar experience to us all to encounter cases of acute pharyngitis characterized by reddening and swelling of the pharyngeal follicles without inflammatory manifestations in the faucial tonsil. "There may be a small white spot at the summit of its convexity and this would seem to be similar to the phenomena occurring in acute lacunar tonsillitis.

In the latter there is a development of pathogenic bacteria in the crypts of the tonsils, with formation of toxine which is absorbed into the tonsillar tissues. Through the chemotactic properties of the toxine, emigration of leucocytes occurs from blood vessels of the vicinity of the crypts. These leucocytes, together with desquamated epithelial cells, constitute the white spots seen in simple, acute and proliferative tonsillitis. Where the bacterial toxine is stronger, coagulation of the albumen in the superficial tissue of the crypts occurs with formation of fibrin as a result of which the area of white about the lacunae is widened.

In those individuals whose tonsils have been extirpated, an acute follicular pharyngitis occurs as frequently as before. It would seem to be due to a predisposition for such infection on the part of the individual. While experience has shown that the faucial tonsils are the most vulnerable point of entrance for micro-organisms, and while certain previous alterations in these structures favor such infections, yet we are, nevertheless, impelled to believe that normal lymphoid tissue presents no barrier. Such a belief brings us very directly to a consideration of the part played by the host itself in relation to the pathogenic micro-organisms. Even if on examination the tonsils, as well as lymphoid tissue, appear to be normal, we are not thereby able to say that they have not been in the past points of entrance for micro-organisms. The history of the case would be of assistance. If it is possible to test the opsonic index of the individual with reference to the micro-organisms suspected of etiological relation which have been recovered from the throat confirmatory evidence would thereby be obtained."

With evidence such as this, and a very small part of a most extensive literature, we rest the affirmative evidence. On the negative side E. Fletcher Ingals,[13] on The Relation of Tonsillitis to Rheumatism, says, after an analysis of his own cases, that 45 per cent of his cases of tonsillitis have a rheumatic history, but 16 per cent of other affections of the throat and chest also have a rheumatic history so that not more than 29 per cent of the cases of acute tonsillitis can be fairly attributed in any way to the rheumatic poison, and more than half of these are doubtful.

Only 19 per cent of his patients gave a history of previous articular rheumatism, and 18 per cent a history of muscular pains ascribed to rheumatism, 8 per cent of the cases of acute tonsillitis were attended by or immediately followed by articular rheumatism, the same number claimed to have had muscular rheumatism, and in 5 per cent the rheumatic attack immediately preceded the angina.

There is not as yet sufficient evidence to prove that the tonsil is only, or even, the chief portal of entrance for the rheumatic poison. Considering, however, that in all probability acute articular rheumatism represents a mild type of septic hematogenic infection of the joints, there is no reason why the tonsil, with its notorious facility for infection with pyogenic germs should not, possibly even frequently assume the role of an infected wound leading to septic consequences of a systemic nature. These vary in degree and location, and rheumatism is, perhaps, one of the phenomena. The evidence does not justify the belief that inflammation of the tonsil may prevent or take the place of an attack of rheumatism. The statement that the acute beginning of muscular rheumatism is nearly always preceded by tonsillitis is not supported by the history of his cases, in only 2 per cent of which did muscular rheumatism follow tonsillitis; however, in 6 per cent muscular pains that were called rheumatism attended the tonsillitis, though they may have been due to the fever attending tonsillar inflammation.

A. Jacobi[9], in his Presidential Address at the Eighteenth Annual Meeting of the American Pediatric Society, takes up the subject of the tonsil as a portal of microbic and toxic invasion. "In diphtheria, whenever the membrane is limited to the tonsil, there is very little or no glandular swelling in the neighborhood. On the other hand, if a membrane extends from the tonsil to its neighborhood, or starts at a distance from the tonsil neighboring lymph bodies swell at once. Again, the treatment of this neighborhood shows its effect almost immediately on the swelled glands. That is mostly evident when the seat of the membrane is anywhere in the posterior nares which excel by an immense network of lymphatics. On the other hand, when it covers the vocal cords and Morgagni's fossa, both of which have only a scanty network of lymphatics, there is no adenitis nor any constitutional symptoms. In the so-called pseudo-membranous croup there is no glandular swelling or fever." The anatomy of the tonsil was also presented. "A surface lesion must always be supposed to exist when a living germ or toxin is to find access. If that were not so, no human or inferior animal could exist under the clouds of microbes, and toxins surrounding us. There is only one exception. Stoehr has shown small gaps between the normal epithelia of the surface of the tonsil. It looks rational, therefore, to admit that when there is merely a surface lesion, though ever so slight, there may be an invasion into the tonsil. When, however, the vessels are exposed to pressure by newly formed cells or tissue, there is no invasion, certainly not beyond the tonsil itself, no ganglionic swelling, no toxic poisoning. It is even rational to believe that now and then, when tonsils, or what is more common, a single follicle becomes inflamed, the very venous obstruction will exert the bacterial influence of the stagnating blood serum." He then quotes freely from Geo. B. Wood's essay on the lymphatic drainage of the faucial tonsils[3], that "he (Wood) takes things too easy. What he sets out to prove he simply postulates. He takes the theory of tonsillar invasion for granted, wisely concludes there must be a sufficient number and calibre of afferent and efferent vessels, and courageously postulates as an anatomical fact what he proposes as a theory.

"A number of facts should be considered in connection with the structure and the absorbing and transmitting power of the tonsil. Its surface epithelium is, according to Stoehr, not uniform, and may admit foreign material without a lesion, thus an invasion into the normal tonsil is possible."

"A catarrh with destruction of epithelium may add to that possibility. The lymph current near the tonsil is less active than that of the pharynx at some distance. There are, moreover, (Labbe), no lymphatic sinuses around the tonsil. There is a system of closed canals in the follicles which do not open into the connective reticulum. This observation of Reterer is confirmed by Hodenpyl. The external deep surface of the tonsil is covered by a firm fibrous capsule. Still, according to many, there is a lymph communication between the tonsil and at least one gland situated near and below the crossing of the sternocleido-mastoid and digastric muscles. Exposure and many diseases change the surface and the structure of the tonsil. Every new inflammation changes them. New cell infiltration and cicatricial tissue renders absorption less possible. Blood and lymph vessels are compressed and undergo atrophy. That is why in advanced life the tonsil gets harder and smaller, and infections become less. No tonsil remains long in its original condition; and the same deleterous influences will no longer prove effective.

Laboratory injections into the normal tonsillar structure are made under pressure, and prove nothing, or very little, for the unembarrassed organ when in situ, and surely not under pathological conditions. Thus, while the normal infantile tonsil which has not suffered from previous exposure or disease may, or must be believed to permit some invasion into the tonsillar structure, and sometimes even beyond it, microbic invasion through the tonsil is not predominant over that which takes place through the lymph apparatus of the pharynx.

That agrees perfectly with the clinical observation of local toxic affections of the oral cavity, according to which membranous affections limited to the tonsil cause no, or little, adenitis or constitutional symptoms."

Thus, here in brief are some of the opposing views.

It seems but fair to present the reply of Wood[14], who says in a recent letter that "I have not in the least changed my views concerning the importance of the tonsils, not only in local infection, but also in a great many cryptogenic and general infectious processes. The question of tonsillar origin of rheumatism, for instance, is being recognized more and more every day; certain cases which have resisted all other treatment get well after the removal of the tonsils. Personally, I believe that the faucial tonsil is much more important in the etiology of infections than the other tonsillar tissues, because the crypts of the tonsil are so constructed as to favor the retention of organisms and decaying epithelial cells. To say that the tonsillar manifestations result from an already existing infection makes a very hard knot to be untangled. How does the infection get to the tonsil, and why should it pick out this structure for the localization of pathological processes? If it is of lymphatic origin then the infection must travel against the current, and the glands of the neck must possess a very mysterious sort of latent power, as they show pathological changes subsequent to the tonsillar symptoms. Examples of such would be acute tonsillitis and tuberculosis."

In the recent discussion on this subject of which Goodale's essay, already quoted, was the opening, the consensus of opinion among laryngologists was that the infection did enter largely at least by way of the tonsils. This divergence of opinion existing among serious and earnest workers of the profession should find some mean of settlement, and as a rejoinder, we may present a brief resume of two recent papers.

S. J. Ross[15], The Role Played by the Tonsil in Organismal Disease, says that it has often appeared to him that general practitioners are often apt to overlook the important part played by the tonsils as the points of entrance of organisms in specific diseases. He cites the case of a woman, aged 40, with tonsillitis. Cultures showed streptococci and staphylococci, the former largely predominating; four days afterwards, when the tonsillar symptoms subsided, and she had a rigor a large spleen and a typical endocarditis ensued.

E. A. Tracy[16] reports two cases of acute inflammation of tendon sheaths sequential to acute tonsillitis. Finally, from a recent editorial in the *Therapeutic Gazette* (July 15th, 1907), Hobart A. Hare, editor, I quote in part:

"Recent investigations, combined with clinical studies, have proved again and again that the tonsils in the majority of instances act as an efficient barrier against the entrance of infecting micro-organisms into the general system, and the swelling of these glandular tissues after exposure to certain infections is undoubtedly the result of a battle royal between the resistance of the individual and the parasites which are attacking him.

To remove tonsils which are, to a large extent, healthy, would, it seems to us, remove one of the barriers introduced by nature in the pathway of infection, but chronic cheesy tonsils should always be regarded as areas from which invading micro-organisms may descend upon the general system of the patient. It follows, however, even if the patient suffers no discomfort in his tonsils, these tissues should be carefully treated, and they may be removed, particularly if they are the only infecting source which can be discovered."

Rheumatism once established, may show itself in the nose, pharynx, and larynx, and distinct rheumatic affection of the crico-arytenoid articulation has been shown to exist.

Laryngologists have frequently made the diagnosis of a rheumatic affection of the upper air passages; then only eliciting a history of rheumatism, and with appropriate treatment cured the patient.

That affections of the upper air passages may cause symptoms of articular rheumatism has been shown by K. K. Whelock, who reports an abscess of the antrum causing symptoms of acute articular rheumatism.

Almost all that has been said regarding rheumatism applies to the condition known as gout, except that in the latter there is frequently a concurrent condition in the nose of a vasomotor type Many of the nasal symptoms subside when treated in the same manner as gout, and these have been variously labeled as due to the lithaemic or gouty diatheses.

Of the relation of the upper air passages to diabetes, a very interesting chapter was presented by the pupils of Leichtenstern[17] of Cologne after his demise, from his observations on this subject, entitled "Laryngeal Disease in the Course of Diabetes," (Laryngitis Diabetica). He notes the difficulties in the way of a diagnosis of this affection by saying that a glance at the host of secondary diseases of the larynx teaches that the laryngologist to be master in his field of work, which, though limited to a narrow field in one sense, yet from a pathological point of view, and especially from an etiological standpoint, covers an immense field, must have a knowledge of many differing acute and chronic disorders, above all affections of the lung, but also of many infectious diseases. He must have a comprehension of neurology, syphilology and dermatology. In a word, must be a thorough physician.

He was led to this statement for the reason that the cases seen by himself had been passed over without a correct diagnosis, which he cannot consider, however, as a reflection on those who had previously seen the patients. He cites four cases, all practically alike, one of which, in brief, may be quoted.

A singer, female, of tall, stately figure, not over stout, complained that her voice was gradually failing. At first she noticed it only in responding to encores, but of late it affected her so that she felt herself unable to continue her vocation. Her sensation was that of dryness, though she never had any inordinate sense of thirst, nor was there any emaciation. Except that her cords looked dry and shining, as though varnished, there was no abnormality to be seen. The urine showed a specific gravity of 1036, and sugar was found amounting to 70.4 grams in twenty-four hours. With rigid diet, the sugar disappeared, and there was a complete return of vocal power.

The condition is spoken of as Xerosis, and occurs in but a small percentage of diabetics, and is an early symptom of the condition, the discovery of which thus early being of great advantage to the patient. Diabetic furunculosis of the larynx occurs among the later manifestations, but is also rare, the writer having seen it twice in 412 cases of diabetes. He never saw a perichonditis to follow this condition, though it may occur. While diabetics are prone to furunculosis, due to the entrance of pyogenic staphylococci, the laryngeal mucous membrane withstands these, and it requires a special vulnerability to permit their entrance. Any acute laryngitis may, however, prove a fertile spot for their entrance, and hence diabetics should avoid a laryngitis.

Phlegmonous circumscribed laryngitis comes suddenly, there is a sharply circumscribed inflammatory process, followed by serous exudate; the oedema is followed by abscess in a few days.

Freudenthal[18], (Diabetic Ulcerations of the Throat), reports five cases of this affection, two of whom died. The third case, with ulcer on the epiglottis and inter-arytenoid space occurring in an elderly man, recovered from his throat symptoms by patient daily treatment of orthoform. In the fourth case an ulcer of the tonsil existed and analysis revealed the presence of diabetes, while in the fifth case the ulcer was on the left arytenoid cartilage.

From this presentation we may conclude: That infection in rheumatism and gout enters the system by way of the mouth, the opinion of the majority being that the chief point of entrance is the tonsil.

That rheumatism may affect as such the nose, pharynx and larynx.

That gout affects the larynx, but most frequently the nasal mucosa. That diabetes may be discovered very early by painstaking examinations in certain laryngeal cases, a late symptom being furunculosis of the larynx and possible perichonditis, and that fatal ulcerations in the throat occasionally manifest themselves in diabetes.

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PRIMARY TUBERCULOSIS OF THE UPPER RESPIRATORY AND ALIMENTARY TRACTS, WITH REPORT OF TWO CASES OF PRIMARY TUBERCULOSIS OF THE UVULA.*

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PRIMARY TUBERCULOSIS OF THE UPPER RESPIRATORY AND ALIMENTARY TRACTS.

Tuberculosis, presenting any phase, in any location, is manifestly of such great interest to the medical profession in general that I shall not apologize for this report of two rather rare and interesting cases of presumably primary tuberculosis of the uvula and soft palate, with a brief discussion of primary tuberculosis affecting the upper respiratory and alimentary tracts, mention of several cases not previously reported, and some deductions relative to diagnosis and treatment.

It is vitally important for us all to know and appreciate fully that primary lesions of tuberculosis may and do appear in these unusual places, with, at first, slight, hardly noticeable symptoms, which subsequently may rapidly increase and then indicate pathological changes that may be the cause of much distress and even death.

Granting, if you please, that the diagnosis and treatment of primary and secondary lesions, caused by the bacillus tuberculosis, in the region of the nose, mouth and throat in the late stages are usually in charge of or under the supervision of capable, skilful men, experienced in diseases of these regions, we must still remember that these lesions, often causing insignificant symptoms, are, in the early stages, most frequently under the observation, advice and treatment of the family physician, not especially skilled in this practice, at just the time when the best results from simple treatment are obtainable, and come to the rhinologist, stomatologist and laryngologist when the apparently simple local condition is so far advanced in its progress toward a most severe ulceration, that any treatment will avail little or nothing more than palliation. The cases which I cite below indicate that it behooves us to always give careful attention and consideration to even the most ordinary appearing lesion of the upper respiratory or alimentary tract, that may be evident on just casual examination, remembering that, with no general symptoms, and often with but slight local symptoms, we may have a primary localized tubercular infection, very small in size, with nothing in its appearance to indicate its serious character, that may, if not properly treated, develop and become a large focus of disease, which can not by any means, medical or surgical, be eradicated and may ultimately cause the death of the afflicted individual.

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Primary tuberculosis, by which we mean that form of tuberculosis in which the infection is direct, not passing to the part by blood vessel, or lymphatic channel, and more narrowly, with no other tuberculous infection in the same body. as an affection of the upper respiratory and alimentary tracts, is a remarkably rare and unusual condition, when we consider the functions of these parts and the cause of tuberculosis.

Accepting the fact, as demonstrated by Koch, that the cause of tuberculosis is the bacillus tuberculosis, and that this organism is present in man in the most widespread of all diseases, and is the prime factor in disease of animals which are most frequently in contact with man, in as high a per cent as thirty (Osler), we must feel that the cause is very widely disseminated, and appreciate that it is, indeed, wonderful that the infections by air and food are as infrequent as we are led by statistics to believe.

The special function of the upper respiratory tract is to act as a passage for the respired air, and to prepare the inhaled air to pass into the lungs. In ordinary breathing we inhale about one-half a liter of air at each inspiration (Zarniko), and in ten inspirations, according to Hesse, we inhale in sleeping rooms after cleaning 180 germs, and in the same room with no dust flying only 20 germs, and, according to Petri, in stables 414 germs, and in factories at windows 90 germs. In general, then, this will average about 30 germs per respiration, possibly, or 600 per minute, and 3,600 per hour. Observations by Hesse, Spree, Aschenbrandt, Paulsen, Kayser, Bloch, Zaufal, Thompson, Hewlett and others indicate that almost all the organisms that enter the nose in ordinary breathing are arrested by the linings of this organ and of the nasopharynx, and that very few reach the larynx except in forced nasal breathing and mouth breathing. From these facts, it seems surprising that we no more frequently have primary infections of the mucous membrane lining the nose and nasopharynx by the bacillus tuberculosis, but it can be easily understood why the parts lower in respiratory tract are not more frequently primarily affected. Dismissing the fallacious belief that we inhale millions of tubercle germs at every inspiration, but accepting the fact that we do receive sufficient numbers of the organisms to cause infections of the nose and nasopharynx, why it is that we so infrequently find primary tuberculosis in these regions? Briefly, the beliefs usually advanced are: The extension of the protecting skin well in upon the septum, where as a rule, tubercular infiltration or ulceration first shows itself; the high degree of nervous reflex present in the nasal mucosa giving rise to violent reaction on stimulation, with secretion of watery mucus or sneezing; the presence of the usual amount of mucus, in which the infection is received, and by which it is washed away, or, if the mucus dries, sneezed or blown away, or passed through the posterior nares and expectorated; the germicidal action of the mucus, as demonstrated by Wurtz, Lermoyez, and D. Braden Kyle, which inhibits the growth and multiplication of organisms; the movement of the cilia of the epithelium toward the entrance of the nose, and, lastly, and probably of least importance, the vibrissae at the vestibule of the nasal fossae. Cornet says that, on account of the above-mentioned protections, "the nose affords the worst conceivable conditions for the growth of such bacteria as are not easily endowed with specially active proliferative tendencies, and for the tubercle bacilli particularly." Without question, the presence of abrasions, contusions and wounds on the mucosa of these parts favors the possibility of infection, and, for this reason, the pernicious habit of boring into the nostril with the finger nail or handkerchief, as well as the placing of foreign bodies in the nostrils as is common in childhood, is certainly a cause of abrasions that are an open sesame to the infective agents that may be present at all times, as had been noted by Schmitthuisen, St. Clair Thompson. Kiaer, Rosenberg, Felici and Major.

The upper alimentary tract has for its function the reception of food and drink, with a part of the beginning of digestion of this material, and most unfortunately, in far too many cases, in individuals of bad habits in breathing or those suffering from some nasal obstruction, serves as the upper respiratory tract, as also the receptacle of dirty fingers and foreign bodies in both children and adults. It is needless to remind one that mouth breathing in itself gives the greatest opportunity for infection to occur from the inhaled germ-laden dust, but we must bear in mind that the infection in these cases is almost always pulmonary, primarily. The thick, resistent, squamous epithelium of the mouth, constant movement of the tongue, lips and cheeks, prohibition of growth of tubercle germs by oral mucus (Cornet), passing of saliva and mucus from mouth into pharynx and esophagus, with the infection, before a focus of low resistance may be infected, all afford protection much greater than that of the nose, so that ordinarily no infection takes place in mouth and pharynx, unless the lining membrane is injured, olthough it has been shown conclusively by Cornet and others that such infection can take place through intact epithelium. Even although areas of irritation and points of trauma are so often present in the mouth and pharynx, making it especially susceptible to infection, when in pulmonary tuberculosis the mouth is constantly bathed in infective sputum, we rarely find even secondary tuberculosis of the tongue, lips and cheeks, and the primary form is obviously most infrequent.

Admitting that inspired air with its contained tubercle germs exposes the nose most frequently to infection, and realizing, as stated above, that the trauma quite necessary to nasal primary infection is very often present, and accepting the results of Hesse's experiments which indicate that the organisms that enter the nose are mostly thickly deposited at the entrance of the upper respiratory tract, and diminish in numbers as we pass lower in the tract, so that we find few organisms in the larynx, we can readily see why primary infections of the nose are more frequent than those of the nasopharynx, larynx and trachea, and why the condition manifests itself as an ulceration or infiltration on the septum usually; occasionally on the lower or middle turbinate. Considering the frequency of septal ulcerations, I am inclined to think that it is perfectly fair to believe that there are often primary tuberculous foci in the nostril that are considered of little importance, and never diagnosed other than as simple ulceration of the septum, being healed rapidly by curetting and application of proper remedies to the diseased area. This may be the cause for the small number of cases of primary tuberculosis of the nose which we find reported, as often only those ulcerations which are not attended properly, and not soon cured, draw special attention on account of their tendency to progress sluggishly or rapidly, as the condition may be. According to Prota, "tuberculosis of the nasal fossa is a very rare condition, and the primary form without pulmonary complication is still more uncommon. Many of the older writers doubted the possibility of tuberculosis of the nasal mucosa. * * * More recently other authors have admitted that tuberculous ulceration of the nose was possible, but only rarely." In a broad sense, practically all cases of tuberculosis of the nose are primary infections, in that they are direct infections (not by lymph or blood channel), but in the narrow sense, with no other tubercular infection in the body, few of the cases of tuberculosis of the nose may be considered primary infections. Lennox Brown says: "Tuberculosis of the nose must always be conceded to be both rare in circumstance and as a primary or early process," feeling no doubt that practically all nasal infections are direct. Cartaz has collected eighteen cases of nasal tuberculosis, seven under his own observation. Of these a great majority had pulmonary tuberculosis. Chiari cited twenty-one observations of "solitary tubercular tumors in the nose," and, according to Shurly, has published four cases of primary tuberculosis of the nose. Coakley says that a few cases of primary tuberculosis of the nose have been reported and states that the nose is the least frequent seat of tuberculosis of any of the divisions of the respiratory tract. Dionisio, in 1892, found sixty-four cases of tuberculosis of the nose. Farlow has reported two cases of primary nasal tuberculosis. Gradle believes that primary tuberculosis of the nose is occasionally encountered. Hajek collected twenty-seven cases, Heryng ninety cases, and Herzog described twenty cases, his being all primary in origin. Juffinger has written upon nasal tuberculosis, Kafeman has published two cases of primary infection. Knight mentions its rarity and agrees that it may be primary. He feels that the presence of the bacillus tuberculosis in the lesion of the nose presupposes the precedence of abrasion of the mucosa. Mertens, in 1889, described thirty-one cases; Olympitis, in 1890, collected thirty-nine cases; Reidel, two cases, possibly primary; Rethi, one case with no other lesion; Sakolowski and Shaeffer have reported on nasal tuberculosis. E. L. Shurly has never met primary nasal tuberculosis in his practice. Tornwaldt and Willick have made many observations regarding nasal tuberculosis. Without doubt, some of these cases mentioned by different individuals are duplicates of cases appearing in other reports, but I am quite sure that it is safe to consider that certainly one hundred cases of primary tuberculosis in a broad sense have been reported, including those of Sachs, Symonds and Williams, mentioned by Jonathan Wright.

In the nasopharynx, which is not subjected to the trauma that affects the anterior nares so frequently, with the same means of prevention from the infection as the nose, and with a lessened number of organisms on account of the inspired air passing through the nose, but with a better chance of retaining the infection in the crypts of the pharyngeal tonsil than on the relatively smooth mucosa of the nose, it is fairly conservative to estimate that about fifteen cases of primary tuberculosis have been reported, the infection always being in the adenoid tissue in the vault. Dieulafoy was the first to point out that there may be tuberculosis of the nasopharynx, as mentioned by Shurly, and Dmochowski, Fischer, Gottstein, Pluder and Suchanneck have all reported cases of primary tuberculosis affecting the nasopharynx. Tuberculosis of the nasopharynx resulting from coughing in persons afflicted with pulmonary tuberculosis is fairly common, I should judge from statements by Baup, Dmochowski, Frankel, E., Koschier, Lartigau, Lewin, Wendt, Wright and Suchanneck, and Nicoll; Lartigau and Nicoll, from their experiments, believe that primary pharyngeal tuberculosis is much more frequent than is usually supposed.

Primary tuberculosis of the lips is so exceedingly rare that it really merits but passing mention. The reasons for its infrequency are obvious. Eiselberg, Platnikow and Scholtz each report a case of primary tuberculosis of the upper lip.

A few cases of primary tuberculosis of the tongue are recorded, but the condition is very infrequent. I personally have seen one case in which the tongue was affected with tuberculous infection primarily, *we thought,* from a pipe-stem wound. The condition was cured with difficulty after long treatment. I thought I had found another case of primary tuberculosis of the tongue a few months ago, but the condition proved to be syphiloma. Bonzemet mentions a case of tuberculosis of the tongue, which had disease of the lungs eight months later. Capart speaks of a case. Grasser has reported a case in which a tuberculous tumor formed on the tongue at the site of a cigar burn. Laboubene has reported a case with disease of lungs fifteen months later. Mendel has cited a case of lingual ulcer with typical tuberculous lesion in base of ulcer opposite first molar tooth. Schlieferowitsch has added to these two cases of lingual tuberculosis, with no disease apparent in lungs as long as the patients were under observation. Tanturri says that he considers that primary tuberculosis of the tongue is easy to heal. Knight reports a case of deep ulceration of tongue, diagnosed carcinoma, for which the tongue was removed.

In the oropharynx, if the cases I report were not conclusive evidence of the occurrence of primary tuberculosis, we would have to accept the report of Fairlee Clarke, of the 18-year-old boy, with tubercular ulceration of the roof of the mouth and destruction of the soft palate, with no indication of tuberculosis of the lungs either clinically or postmortem, and consider Isambert's disputed case, in which a young boy had tubercular ulceration of the velum, with no positive signs of pulmonary tuberculosis, although he had scrofula and suspicious rhinitis when he was very young. M. Barbier reports a case of tuberculosis of the velum and tonsils. Bosworth has written that from a practical standpoint primary tuberculosis of the pharynx is not important, although it certainly may occur here, as "in any region of the body"; in connection with tuberculosis of the pharynx, his dictum, "it would seem that a deposit of miliary tubercle in the mucous membrane of the respiratory tract assumes a peculior virulence as the seat of the deposit is in portions near the outer world," assumes considerable interest. Carriere has noted a case of tubercular ulceration in the cheek of a man, not primary in character, although doubless infected directly. Coakley feels pharyngeal primary infection is exceedingly rare, and thinks infection must occur in abrasion. Chappell has reported three cases of tuberculosis of the oropharynx, one of which was primary, in a young woman infected from her sister. The condition ran a rapid course. Inoculation tests were positive, and the tubercle bacilli were found in the sections. Gleason believes pharyngeal infection takes place in an abrasion. Gradle says that the soft palate is more often affected in primary tuberculosis of the pharynx; that the ulceration, when low, causes great pain in swallowing and may cause patient to starve. He feels that diagnosis must be easy, and believes that demonstration of the tubercle bacilli in section makes absolute the diagnosis. In case of doubt in histological examination, he believes that the tuberculin test will determine the condition. Grogler has reported a case of primary tuberculosis, in which the bone part of the palate was affected. Guttmann and Lublinske consider that 1 per cent of tubercular patients have secondary tuberculosis of the pharynx, and remark on the general tendency for ulceration in this region to be regarded always as syphilis. Heinze has found fourteen cases of secondary tuberculosis of pharynx in 1,226 cases of pulmonary tuberculosis. Kessler has reported a case of primary tuberculosis of the palate and pharynx. Knight says, referring to primary tuberculosis of the pharynx: "Primary cases have been reported, but there is always a suspicion that a deep-seated or limited lesion in the lung may have escaped detection." Kussner has reported a case of palatal infection, not primary. Levy, from a large experience in Colorado, has found that about 1½ per cent of cases with pulmonary tuberculosis have pharyngeal lesions. In his experience, the course of pharyngeal tuberculosis has been very rapid, terminating in from three to four months. Morelli mentions a case of primary tuberculosis of the mucous membrane of the gums and cheek. P. Schoetz has reported a case of probable primary tuberculosis of pharynx. Scheh, according to Lennox Brown, has been forced to the belief that the pharynx is affected with primary tuberculosis only apparently, and Brown is in accord with this belief. Shurly says he has met but one case of primary tuberculosis of the walls of the pharynx and back part of cheeks, which were sprinkled with little nutmeg-colored nodules, which by amalgamation broke down into ulcers. Newcomb believes that the uvula and soft palate is most frequent, and that primary tuberculosis occurs in the pharynx in 1 per cent of all acute tubercular infections. He says that it is not necessary that there be a solution of continuity of tissue for infection, as, according to Strauss and others, infection may take place through intact mucous membrane, and in a recent number of the Laryngoscope he calls attention to acute tubercular infection of the pharynx, which on inspection might be easily mistaken for diphtheria. Sleicher has reported a case of primary infection of the pharynx, while E. Sokolowsky has found no case. In 1,307 autopsies Willigk found one case only affected with pharyngeal tuberculosis. Unkerman has reported a case of primary tuberculosis of the velum.

The tonsils seem to be quite frequently affected with tuberculosis primarily. I am rather astonished to learn that Robertson says that "8 per cent. of patients presenting for nose and throat symptoms exhibited primary tuberculosis of the faucial tonsils." The cause for the frequency of infection is the open, deep crypt, which receives and cultivates the infecting organism. Shurly, in his complete treatise, "Diseases of the Nose and Throat," gives some little space in his chapter on tuberculosis of the upper air passages to tuberculosis of the tonsils, and believes that the "reports of Dmochowsky, Hannan, Kafeman, Moritz-Schmidt, Schech, Schlenker and Strassman would indicate that tuberculosis of the tonsils is a common accompaniment of pulmonary phthisis, and that it is very often overlooked." He states, further, that Botey, in his experiments with guinea-pig inoculations, came to the conclusion that there exist certain forms of amygdalitis or hypertrophy of a primary tuberculous character, impossible sometimes to positively distinguish from the common hypertrophy of these organs, with which every one is familiar. Wright says that he is inclined to agree with Hoedenpyl that tuberculous tonsillitis is rare, and that the tonsils are seldom the seat of primary tuberculosis, according to Shurly. Shurly says that he has never met with a case of primary tuberculosis of the tonsil, although his observations cover a long period of time and include the observations of several thousand cases of various forms of tuberculous disease. In a search of the literature I find that Abraham, Hopkins, Koplik, Kruckmann, Orth, Ruge, Sacaze, Schlenker have all reported cases of primary tuberculosis of the tonsil, Koplik mentioning three.

Primary tuberculosis of the mouth and pharynx together has been reported by Gleitsman, who cured the case. Morelli and Stark each mention one case, in which tubercle bacilli were found in carious teeth, with no tubercular lesion in the body.

The inspired air is so well freed from the inhaled organisms by the nose and nasopharynx, the air passes with such rapidity through the larynx, and the protection of the mucus and mucosa is such that primary tuberculosis of the larynx is considered impossible by many, improbable by some, but an actual condition by those who have reported cases, and their followers. It is interesting to note some of the views about primary laryngeal tuberculosis. Lennox Browne, in a discussion on Tuberculous Laryngitis, says: "That evidence of the tubercular diathesis influences a local laryngeal inflammation in a manner eminently characteristic, and at a period long prior to the discovery of equally well-marked symptoms in the lungs, is a fact which the daily observation of those engaged in laryngeal practice establishes as incontrovertible. Whether or not there is tubercle actually developed in the larynx, or what, indeed, is the nature of tubercle wherever developed, the author does not presume, and indeed, does not care, to decide. Seeing, however, that tuberculosis is a disease primarily manifesting itself more especially in the respiratory organs, seeing that catarrh is one of the most frequent excitants to that disease, and that many catarrhal inflammations of the lungs commence in the larynx, it is at least fair to infer that, in those cases in which the eye reveals what has come to be recognized as tuberculosis laryngitis before the ear detects the presence of tubercle in the lungs, the disease has primarily attacked the former organ." This was written in 1877, and twenty years later the author seconded his early opinion by saying: "We may, therefore, for the future, consider tuberculosis of the larynx as a primary disease." In 1881, with Dundas Grant, Lennox Browne prepared two papers to which I have referred elsewhere.

Coakley says: "A few cases of well-authenticated primary tuberculosis of the larynx have been observed, but the majority of supposed primary tubercular infections of the larynx show within a few weeks marked evidences of pulmonary involvement. It is always a matter of doubt whether the condition of the lungs is secondary to that in the larynx or whether, as we believe to be the more common, the evidences of pulmonary tuberculosis were at first so slight as not to be detected on physical examination." Knight, without any question in the matter, says abruptly: "Tuberculosis may attack the larynx primarily or secondarily; in the former case, the process is usually acute; in the latter, chronic. Primary tuberculosis of the larynx is believed by some authorities to be not very uncommon, and is thought to have certain distinguishing characteristics. Twenty-nine cases of primary tuberculosis of the larynx have been reported by Aronsohn, three of which are authentic, in seven the coincident pulmonary lesion was limited and believed to be secondary, while in nineteen the diagnosis of primary laryngeal disease was based solely on clinical signs, which, of course, can not be accepted as conclusive." D. Braden Kyle, in his reference book, "Diseases of the Nose and Throat," discusses primary tuberculosis of the larynx as follows, referring to the lodgment of the bacillus of Koch in the laryngeal structure as the essential factor in this condition: "Whether this be a primary condition arising from infection drawn from without the body, or whether it is always a secondary manifestation from a pre-existing pulmonary consumption, has long been a theme for discussion. With Cohen and others, the author believes, however, that primary infection of the larynx may occur. This view is fully sustained both by theoretical considerations and by postmortem examinations." Newcomb writes: "There is no longer any doubt that tuberculosis may primarily affect the larynx, though many of the cases placed in this category do not present sufficient evidence to exclude the possibility of the existence of some other local deposit to which the laryngeal affection is secondary. So far as the writer knows, no case of laryngeal tuberculosis has ever progressed to a fatal termination without evidence of invasion of other structures, though autopsies have sometimes shown the larynx invaded, but the lungs free." Shurly states, in his work to which I have referred several times: "Tuberculosis laryngitis may occur as a primary or secondary affection. Much discussion has taken place upon the question of its *primary* origin, but it must be admitted that it often develops primarily." Wright adds interest to this discussion by saying that "the larynx is by far the most common seat of tuberculosis of the upper air tract, and it is, as a rule, if not always secondary to or associated with pulmonary tuberculosis. . . . This view of laryngeal tuberculosis being always secondary is held by almost all observers, and is proven by the findings of autopsies, there being very few recorded cases of death by laryngeal tuberculosis where pulmonary involvement has not been found. The opponents of this view are very few in number, the most prominent of them being Dr. Gleitsman of New York, whose researches have been extensive, and who reports two cases of primary laryngeal and pharyngeal tuberculosis in his own practice, which were cured. In the report of his cases[1] he quotes Demme, E. Frankel, Pogrebinski, Orth, Coghill, J. S. Cohen, Dehio and Lancereaux in support of his view." He believes it impossible to prove the presence of primary laryngeal tuberculosis without autopsy. He has seen many cases of tubercular laryngitis which he thought were primary, which proved to be combined with pulmonary affection.

I find that de Renzi, Frankel, Josephsohn, Massucci, Orth, Panzer and Trifiletti have reported cases of primary tuberculosis of the larynx, as has also Demme in a child, 4½ years of age, who died of tuberculous meningitis, and on autopsy was found an ulceration of the larynx with tubercle bacilli in it. Boylan, Cadier, Dehio, Fischer, Jones, Jullien and Neidert have described apparently primary tuberculosis of the larynx. Capart mentions a case of primary tuberculous infection of the tongue with later involvement of the larynx. Tanturri cites one interesting case, in which he made a diagnosis of primary tuberculosis of the larynx, with secondary involvement of the tongue, and cites another case of primary tuberculosis of the tongue, with death resulting from tuberculosis of the larynx.

The only recorded case of primary tuberculosis of the trachea is that of Valette.

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[1] Journal of Tuberculosis, April, 1901.

No primary tuberculosis of the esophagus has been described, and the secondary form is exceedingly rare, occurring most easily from without.

PRIMARY TUBERCULOSIS OF THE UVULA.

The history of Case 1, which I obtained from the patient, his family physican and a surgeon who operated on him for rectal fistula, is as follows:

Case 1.—The patient, Mr. J. G., of Irish parents, 43 years of age, married, postmaster, and residing in the northern part of Michigan, presented himself for examination of his throat, which, he said, was badly ulcerated. Mr. G. had been married many years, and had a wife and four daughters living, all in excellent health. His wife never had an abortion or still-born child. None of his relatives ever had any diseases bearing on his condition.

Previous to June, 1900, Mr. G. had always been in excellent health, but at that time he was troubled with a rectal fistula, which was operated upon in a hospital in the State of Michigan. The surgeon who operated on Mr. G. for this fistula informed me that, at the time of operation, he found "an ulcerated growth up the rectum which did not heal kindly." This ulcer, he was reminded by the nurse who assisted him, he thought possibly to be malignant, but remembers nothing about there being any throat complication in G.'s case which required attention. While Mr. G. was convalescing at the hospital he noticed "a reddening on one side of his throat, which afterwards became a pimple." A little later the other side became affected similarly. The discomfort occasioned by the irritation of the lesions on his taking acid drinks was sufficient to cause the patient to call the attention of his physician to it, and by treatment the condition was alleviated and improvement took place. The condition was of such slight interest that no record was made of examination or treatment of Mr. G.'s throat at the hospital. The patient soon left the hospital and attention given the throat was discontinued.

In June, 1902, the patient noticed another sore throat, with a papular lesion on his uvula, similar in appearance to that which he had noticed in his throat previously. This was treated, but not until other papules formed in contiguous tissue, opened and ulcerations resulted, which coalesced and spread over the uvula and on the soft palate. This condition was treated systematically and locally by his family physician, who, regardless of the negative history, suspected syphilis and gave Mr. G. potassium iodid and biniodid of mercury internally, and gave peroxid of hydrogen and borolyptol gargle, with silver nitrate applications locally. It is of interest at this point to note that the patient applied for and received life insurance September 1 of this year, in the examination for which

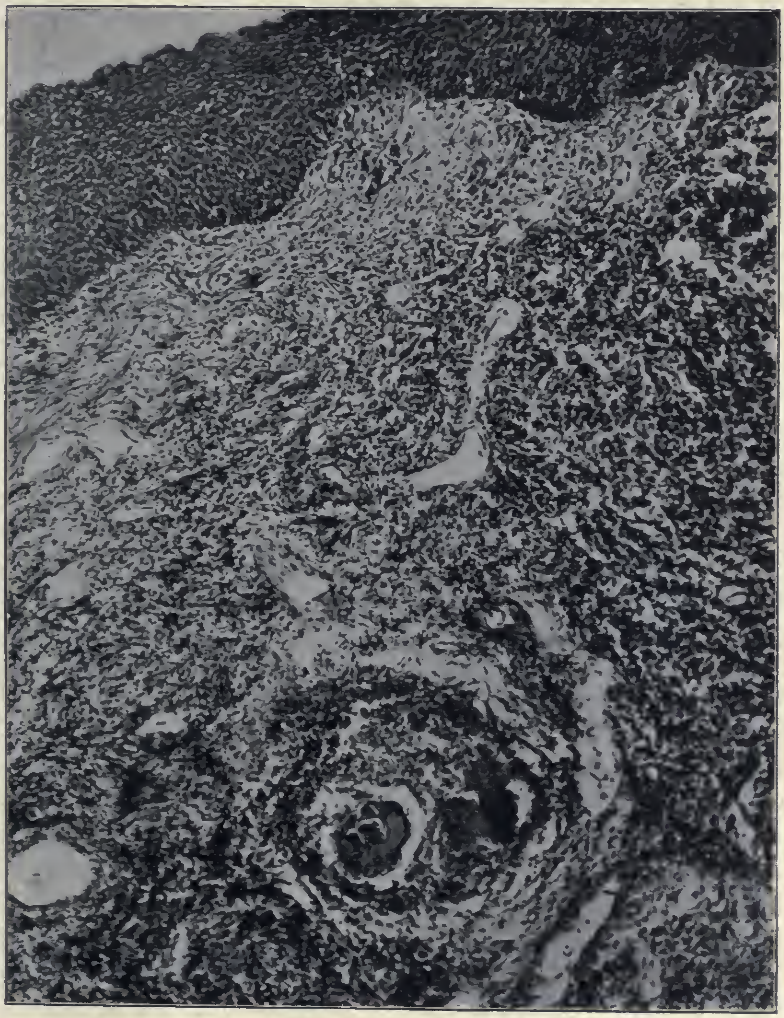

Fig. 1.—Portion of uvula from Baldwin's case. Subepithelial tuberculosis. Epithelioid nodules with caseous centers and containing giant cells.

he stated that he had been attended by a physician within the last two months previously on account of ulcerated sore throat. He was recommended by his physician as a good risk, and was granted a policy, which was afterward contested, I believe.

The treatment that G. had been receiving seemed to interrupt the rapid extension of the disease but for a brief period, and then it appeared to be getting so much worse that his physican advised him to go to Ann Arbor and enter the University Hospital.

Patient came to the hospital Nov. 20, 1902. He complained of sore throat that caused constant pain, great annoyance on account of the discharge from the ulcerated focus, and inability to eat anything but liquid food, and that with great discomfort. Further questioning brought out a firm denial of even a possible chance of syphilitic infection, and a statement that every physician who had seen his throat had asked him if he had ever had syphilis; and, knowing that in order to obtain help for his condition, he must disclose all points bearing on his case, he could only assure me that he had never subjected himself to any chance for venereal infection.

The pathological macroscopical appearance of the ulceration of the mouth was noted for me by Dr. Warthin, who described it as follows: "The posterior half of the hard palate extending to the alveoli at the sides is indurated and thickly set with small miliary nodules, more or less aggregated into larger papilloma-like masses, and covered with a rather firmly adherent, dirty yellow or grayish pus-like exudate. Anteriorly and at the sides there is a gradual transition to normal mucous membrane, but small miliary nodules are found scattered some distance from the edge of the main lesion. Laterally, the ulceration extends in some places over the alveoli, and a few small nodules are present on the buccal mucous membrane. Posteriorly, the free edge of the soft palate is thickened, ragged and indurated, and presents numerous miliary nodules, a few as large as a split pea. The surface appears ulcerated and is covered with the same grayish exudate. The uvula is long, greatly thickened and indurated, its surface ragged, ulcerated and set with small nodules. A few of the nodules are as large as a pea. Near the base there are many miliary nodules. The pillars of the faucea, the tonsils and the pharyngeal wall are not involved. "Dr. Warthin examined the patient and found nowhere on his body any indication of lupus or tuberculosis.

My examination showed that the nose, pharynx and larynx were free from disease, and that the pillars of the fauces, the tonsils and the tongue were not involved.

The points in the history noted, and the appearance of the diseased part, regardless of the specific treatment administered, and the firm denial by the patient of syphilitic infection, lead to the diagnosis: (1) syphilis; (2) epithelioma; (3) tuberculosis; the preference being in the order named. This diagnosis was concurred in by several clinicians; one suggesting that he would consider simple epithelioma first, and another believed it appeared like lupus-epithelioma, rather than syphilis. Curettings from the diseased area sent to the pathological laboratory for histological examination were reported upon by Dr. Worthin as follows: "Bits of tissue removed from roof of mouth for diagnosis show a characteristic

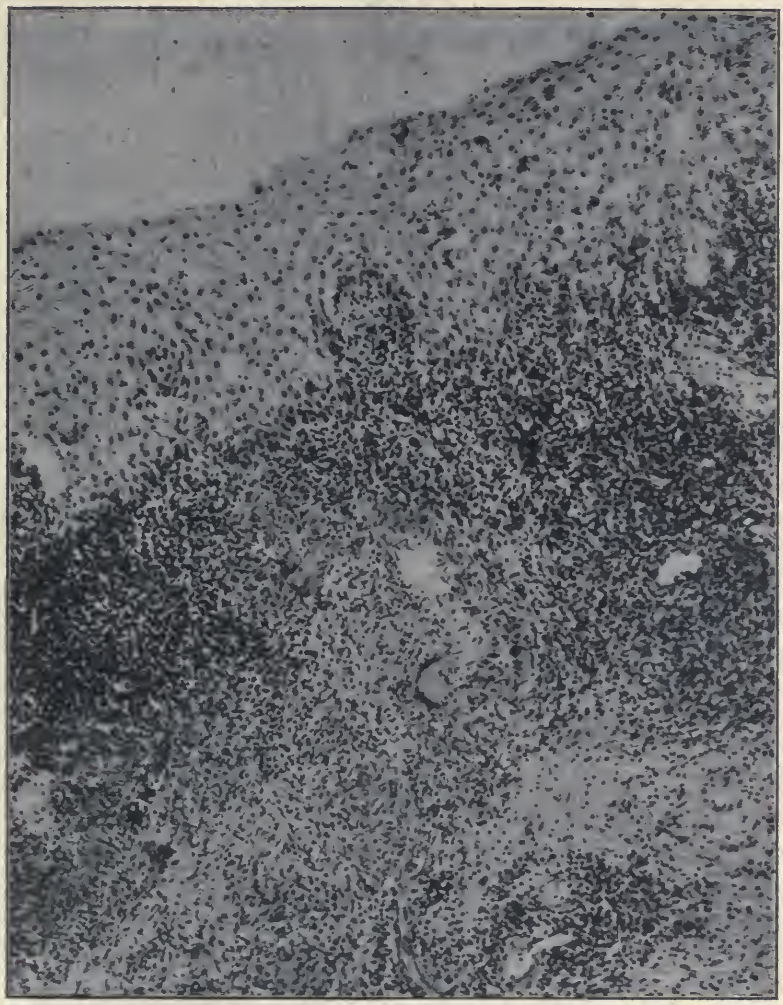

Fig. 2.—Portion of curetting from roof of mouth. Subepithelial tuberculosis (lupus). Case 1.

appearance of tuberculosis. May be syphilis, however, I have not had time to stain for bacilli. No evidence, in the part examined, of neoplasm." A second report on the tissue, a few days later, read: "This tissue shows everywhere a subepithelial tuberculosis; a papillomatous growth. Only in one place is there evidence of caseation change." A still later report of the curettings was as follows: "Further examination of specimens from this ease shows everywhere a subepithelial tuberculosis, though bacilli have not yet been found. Over the tuberculous granulation tissue is a hyperplastic epithelium, a papillomatous growth; in every way the picture suggests the appearance often found in lupus, namely, a lupus-papilloma. Only in one place is there any suggestion of epitheliomatous change, and this appearance may be explained by transverse and oblique cutting of the papilla; but, inasmuch as epithelioma often develops in skin lupus, such changes may occur here, although not yet found. The possibility of a so-called lupus-carcinoma must be borne in mind. (A rare and very interesting case.)"

In the meantime I presented the case, one evening, to the members of the University Hospital Clinical Society, suggesting the possibility of the condition being primary tuberculosis, and the interest manifested made it imperative to determine whether the condition was primary in this unusual locality, or secondary to other lesions, especially in the lungs. So at my request Dr. Dock made a thorough physical examination of Mr. G., and gave him a test with tuberculin to determine whether there were any pulmonary lesions of incipient tuberculosis and to see if the patient would react locally or generally to the tuberculin. The physical examination was negative, as was also the examination of the sputum. The tuberculin test was neither absolutely positive nor absolutely negative. To 1 milligram of tuberculin given November 29 we noticed a very slight rise of the temperature to 100.3 on November 30, and I was informed that the patient's throat felt a little better. To 5 milligrams of tuberculin given December 1 we noticed a slight rise in temperature as before to 100.4 and a slight frontal headache. The patient told Dr. Dock that his throat felt a little more sore than usual, but it showed no local reaction. To 10 milligrams of tuberculin given December 5, we noticed a slight headache, with increased soreness in the throat possibly, but no local reaction. The last reaction, if we may call it a reaction, was less apparent than the others, possibly due to an immunity being conferred by the first injections. The tuberculin test, then, may, with reason, be considered doubtful.

Dr. Nancrede examined the patient's right wrist for a swelling present and reported "tenosynovitis, possibly tubercular."

Dr. Carrow concurred with me in my examination and negative findings in the nose, pharynx and larynx.

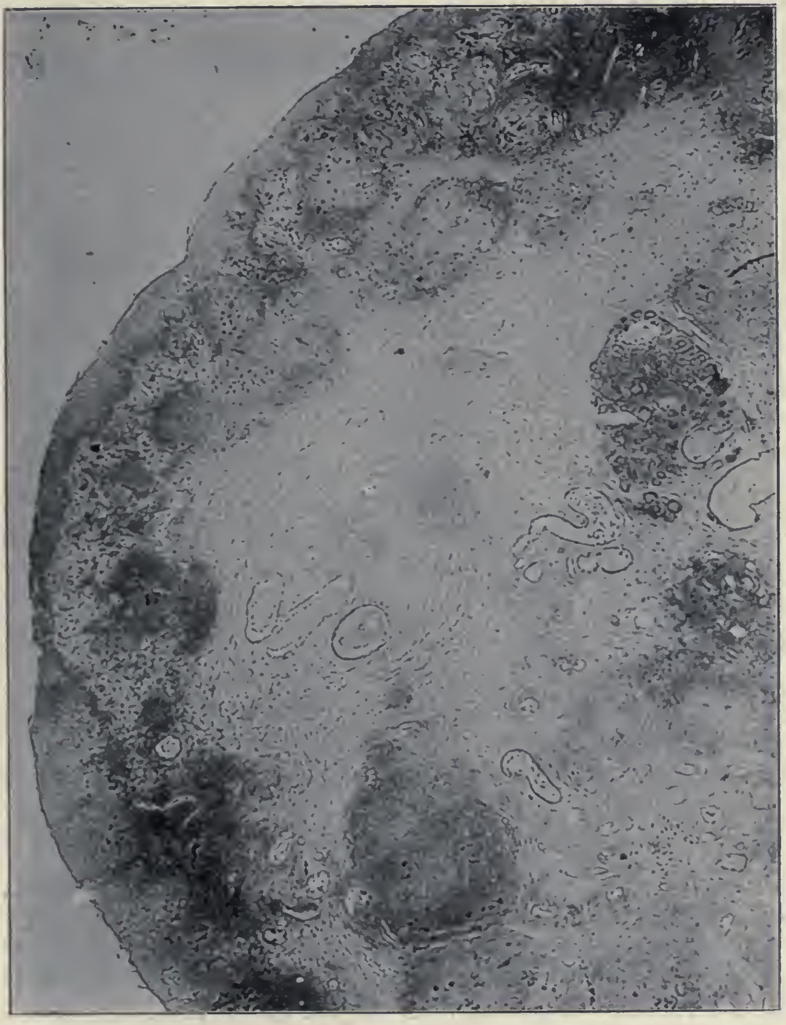

Fig. 3.—Low-power view of part of transverse section of uvula of Case 1. Sub-epithelial tubercles. Tubercles also scattered throughout deeper tissues of uvula.

At this time, as the condition had spread further, getting worse even under drastic treatment, I removed the patient's uvula and sent it to the pathology laboratory, and also sent material to the bacteriology laboratory for inoculation and culture tests. The inoculation and culture tests were all negative, possibly on account of the small amount of tissue sent to the bacteriologist.

The results of the clinical, histological and bacteriological examinations to this time had not given conclusive evidence that the condition was tuberculosis, although it was evident that, whatever the condition was, it was primary in the location of the uvula. Special stains made by Dr. Warthin for the determination of the presence of the bacillus tuberculosis were reported upon as follows: "Tissue removed from the roof of the mouth. Fixed in alcohol, embedded in paraffin, and stained in hematoxylin and eosin. On section there is found the picture of a subepithelial tuberculosis, small nodules of epithelioid tissue without blood vessels, and showing more or less central caseation and containing characteristic giant cells. The connective tissue about the epithelioid nodule is infiltrated with leucocytes and there is a more or less extensive fibroblastic proliferation, causing a lengthening of the papillae. As the result of such lengthening, there are areas of epithelium apparently extending into the connective tissue. Such appearance may be explained by the cutting, and there are no evidences of malignant proliferation of the epithelium. In some places, the surface epithelium is entirely gone, and the surface of the section consists of a mass of epithelioid tubercles, without ulcerating or caseating areas. Many sections were stained for tubercle bacilli with carbol-fuchsin, but without success. Later a few beaded bacilli were found in the caseated areas. A diagnosis of tuberculosis (lupus) of the mouth may be given, considering the clinical history, apparently a primary condition of the uvula and roof of mouth."

A similar report on the examination of the uvula was as follows: "The uvula was fixed in mercuric chlorid, embedded in paraffin, stained in hematoxylin and eosin, carbolfuchsin and methylene blue. Transverse sections were made of the entire uvula. The epithelium for the greater part is intact, but in a few areas is entirely gone. In some places it is very thin, the superficial loyers being absent. Beneath the epithelium and extending entirely around the uvula, there is a zone of epithelioid tubercles, the majority showing caseous centers and containing characteristic giant cells. Some of the nodules are confluent. The tissue about the tubercles is more or less infiltrated with small round cells, and shows a fibroblastic proliferation. The neighboring blood vessels are congested and have thickened walls. Smaller tubercles are scattered throughout the uvula, even in the muscle. The process, however, is pre-eminently a subepithelial tuberculosis. The areas denuded of epithelium present a surface of epithelioid tubercles, in part caseating. In sections a few beaded bacilli are found in the caseous areas."

Besides operative measures to remove the diseased tissue, we used the customary local applications to alleviate Mr. G.'s suffering and to try to prevent the spreading of the ulceration, but to no purpose; in fact, our efforts in his behalf did not seem to improve the condition, and he steadily grew worse, the ulceration spread, and he

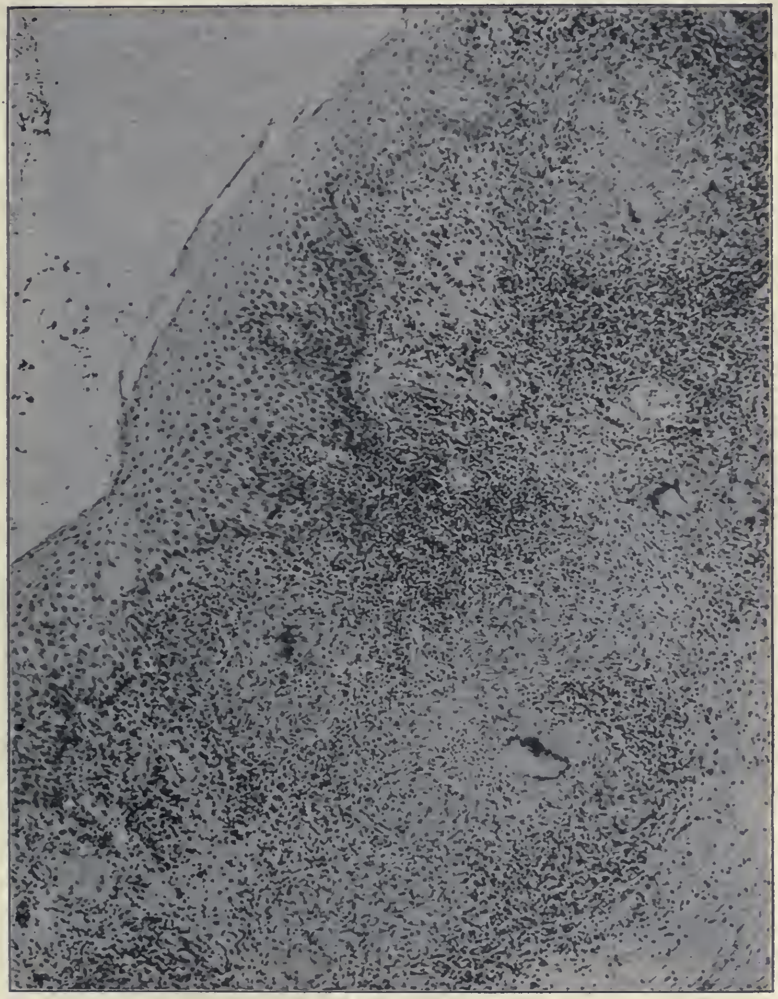

Fig. 4.—Subepithelial tubercles with beginning caseation and containing giant cells. Portion of uvula. Case 1.

rapidly lost weight and strength, so he returned home on December 22, as we considered his case to be hopeless.

On January 28, G.'s physician wrote that since returning home the patient's condition seemed to improve somewhat for a few weeks, which he accounted for by his pleasure at being with his family again; but that this apparent improvement had been but temporary, as he had recently been growing perceptibly weaker and was suffering more pain. He further stated that the ulceration on the roof of the mouth especially had healed quite well, though the surface was broken by pedunculated masses the size of a pea; but posteriorly, and in the region of the tonsils and pillars and upon the alveoli, there was evidence of a spreading of the condition as an open ulcer, covered with a creamy pus exudate. Another communication from G.'s physician, dated March 12, said: "G.'s case is completed. He died February 24 at his home. For about three weeks he suffered from motor paralysis, gradually extending up legs and thighs and body, abdominal muscles and arms, so that the patient was helpless for the last four or five days of his life. Sensation was decreased, so deglutition was easier, and sensibility of mouth, palate and pharynx was diminished. The ulcer seemed to spread along border of gums, down to larynx, trachea and esophagus. His voice was very hoarse, and frequent attacks of coughing brought up enormous quantities of yellow, blood-tinged mucus, almost purulent in character, very difficult to expel toward the last. Gradual failure of strength, impeded respiration, with muscular twitchings, and occasional periods of suffering marked the end. The pulse ran to 150 the last hour, temperature 1 to 2 degrees above normal to subnormal just before death; respiration gradually lessened, with increasing rales, till patient's death. The privilege of an autopsy was denied."

Case 2.—The history of Case 2. I obtained from Dr. D. Braden Kyle of Philadelphia, who, in answer to my inquiry regarding his experience with tuberculosis primary in the region of the uvula and palate, stated that he had seen one case. This case Dr. Kyle courteously allows me to report with the history of the case I have just detailed. In two communications received from Dr. Kyle he says:

"I have seen a number of cases in which the pharynx and tonsillar folds were involved in tuberculosis secondary to the pulmonary lesion, but I have only seen one case of primary tuberculosis of the uvula and soft palate. The ulceration, which was proven to be tuberculous by microscopic examination of the secretion and scrapings from the part, began on the soft palate and uvula, as near as I could obtain from the history, involving both structures when first noticed. There were no pulmonary symptoms until eighteen months later, when a slight lesion was discovered in the right apex. In the meantime the tuberculous lesion had involved the pharynx and later the epiglottis and larynx. The patient was at once sent to Colorado and died six months later. I think that primary lesions of the uvula and soft palate are, indeed, rare, although I think primary

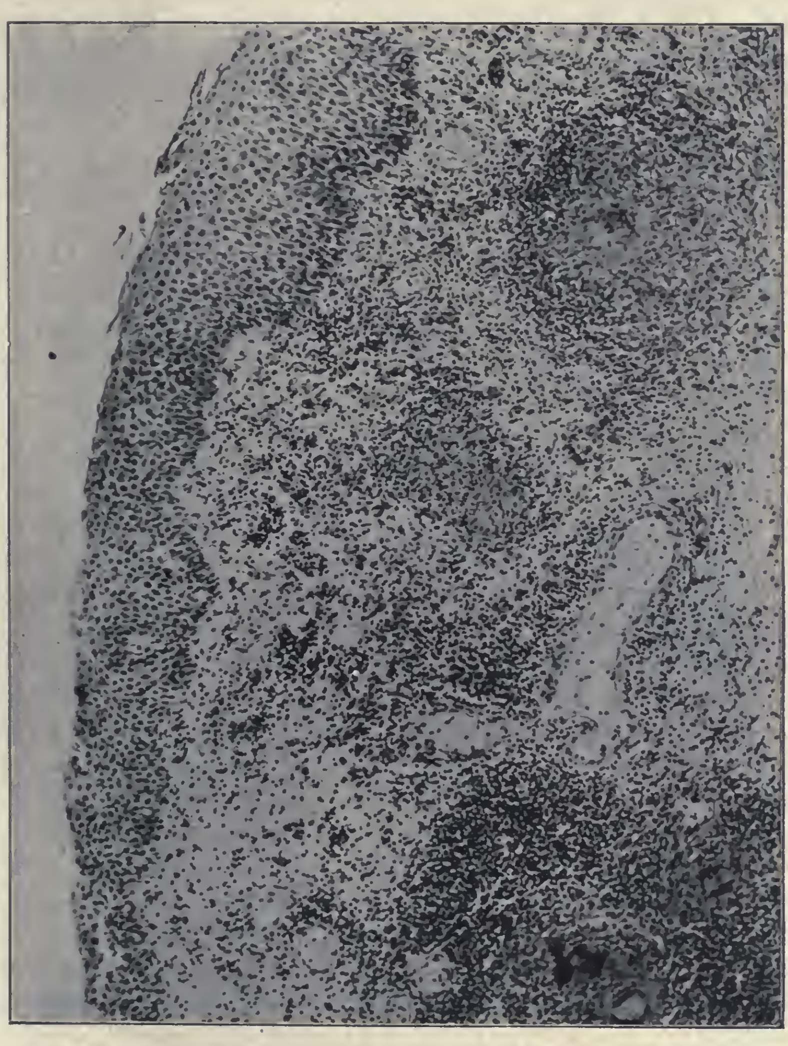

Fig. 5.—Section of nodule from uvula of Case 1. Subepithelial tubercles, infiltration, etc.

lesions of the larynx are more common than is generally supposed." In answer to my request for further data, slides and any additional information regarding the case, Dr. Kyle wrote: "I did not make any inoculation tests, either in animals or test-tubes. The microscopic examination of scrapings showed so clearly and distinctly the tubercle bacilli that I did not think it necessary to make further investigations. Unfortunately I did not retain the slides, but the microscope fields were filled with tubercle bacilli and by contrast stain showed many other bacteria present. Personally, I have not the slightest doubt as to the diagnosis, although it was not confirmed by the tuberculin test or serum cultures."

In a careful examination of the literature on the subject of primary tuberculosis of the uvula and palate, I find one undoubted case, reported by Baldwin as "tuberculosis of the uvula" in his article, "Some Unusual Localizations of Tuberculosis." Baldwin's exhaustive examination of the literature up to the time of this report failed to reveal any case reported in which the uvula had shown tuberculosis. To quote from his paper: "Although tuberculosis of the pharynx and larynx is of common occurrence, I have been unable to find any case reported where the uvula has shown any tuberculosis. This case, then, is unique in that it is one of the first, if not the first, case of tuberculosis of the uvula." Baldwin gave me personally a brief description of this case and the findings as follows: A woman, aged between 50 and 60 years; good family and personal history, with no evidences of tuberculosis, came to Dr. Carrow for a small nodule on the uvula, which was removed and proved to be chronic granulation tissue (tubercular). The uvula was then removed *in toto* and examined. Microscopically, just beneath the mucous membrane was a granulation tissue very poor in blood vessels. Deeper in the parenchyma of the uvula were small masses of epithelioid tissue containing no blood vessels. Scattered through these masses and making up a large part of some of them, giant cells, with peripherally arranged nuclei, were found. Sections of the uvula stained with carbol-fuchsin showed a few tubercle bacilli in the giant cells and in the other epithelioid tissue."

I wish to lay especial stress upon the fact that this patient, whose history Dr. Baldwin gave me, at the last report was alive and well, with no indication of having ever suffered with tuberculosis of the uvula.

Dabney reports having seen "one of the rare cases of tuberculosis beginning in the upper part of the throat." He says that he has seen certainly two cases and possibly one or two others. In his reported case, he found the lesion confined to the roof of the mouth, a typical ulceration causing considerable pain and interfering with the patient's nutrition. Examinations of the scrapings from the ulceration were negative, the diagnosis being based then on the macroscopical appearance. Examination of the patient's chest by several physicians failed to reveal pathological condition of the lungs till ten days before death, when a deposit in the apex of one lung was discovered. In answer to a letter from me, Dr. Dabney wrote me that he had seen another case, unquestionably tuberculosis, apparently primary, with this history: "The patient was a youth, about twenty, whose mother had died of tuberculosis when he was an infant. Her trouble is said to have begun in the throat, probably laryngeal. In the young man's case, before any symptoms could be detected in the lungs, there appeared a worm-eaten ulceration on the soft palate, gradually extending over its surface and down upon the pharyngeal wall. It was attended with great pain in swallowing, steady loss of weight, and a temperature ranging from normal to 103 or more. The appearance of the patient was typically tubercular, and micrscopic examination confirmed the diagnosis. He was sent to Asheville, N. C., but steadily lost ground and died within a few months after the first evidence of the disease appeared."

Lennox Browne has described a case of secondary tuberculosis of the uvula with an accompanying illustration, which has been largely copied in other text-books.

Grunwald, in a personal communication, referred me to his "Atlas and Epitome of Diseases of the Mouth, Pharynx and Nose," in which there is a good illustration of tuberculous lesion of mouth and hard palate, which from the history of the case is doubtless a secondary infection to a possibly primary nasal lesion, "the infection probably traveling from the floor of the nose by way of the lymphatic clefts of the incisive foramina."

Ingals several years ago wrote me that he never had seen either primary or secondary tuberculous infections of the uvula, nor primary of the palate, but had seen secondary infections of the palate and fauces.

Knight wrote me that he had observed several cases of tuberculosis involving the uvula and palate by extension from the pharynx, but no case in which these regions were primarily the seat of tuberculous infection.

D. Braden Kyle in his excellent work, "Diseases of the Nose and Throat," says that ulceration of the uvula occurs as a primary infection in tuberculosis. The tuberculous involvement may appear as small, wart-like excrescences which go on to ulcerations, so arranged that a peculiar club-like formation is given the uvula.

Moussous has reported a case of primary tuberculosis of the uvula, tonsils, and anterior pillars of the fauces.

Phillips, after mentioning that primary disease of the uvula is rarely seen, states positively that lupus does not primarily affect the uvula, but papillomas are occasionally seen, being usually dependent upon syphilis or tuberculosis.

Prota reports a case of primary tuberculosis of the nasal mucous membrane, with secondary involvement of the uvula and soft palate and pharynx. He says in part: "The uvula was in part destroyed. The soft palate was infiltrated with small miliary nodules which were roughened, rose colored and slightly translucent." I note that Prota's bacteriological tests were negative, but that he obtained a positive tuberculin reaction. Although the microscopical examination here was proof of the condition being tuberculosis, he points out the difficulty of diagnosing tuberculosis from syphilis, even microscopically, mentioning the fact that is only eleven of twenty-seven cases of tuberculosis of the nose were tubercle bacilli found.

Sir Felix Semon some time ago wrote me that he had never observed a case of undoubted primary tuberculosis of the uvula and soft palate, but without referring to his case books he would say that he had seen about twenty cases of secondary infections of these parts in thirty years' experience. I was unable to get a copy of his communication to the Laryngological Society of London on "A Case of Obscure Lardaceous-looking Infiltration of the Uvula," etc.

E. L. Shurly wrote me that he had seen one case of primary tuberculosis of the uvula, which spread thence to the lymphatic system of the lungs. He had in mind no case in which the condition was confined to the palate alone, but had seen several cases where this region was involved.

Swain, in a long experience, a few years ago, had not seen any cases presenting tuberculosis, either primary or secondary, of the uvula or soft palate.

Treitel has reported a case of primary tuberculosis of the palate.

Wright has reported a case of primary tuberculosis of the uvula and pharynx.

From the fact that Birkett has mentioned in his report of the case of primary lupus of the pharynx that "the pharyngeal aspect of the uvula shows two distinct nodular infiltrations, each about the size of a lentil, the mucous membrane covering these being quite intact." I have reserved the mentioning of this case until I described affections of the uvula, not wishing to discuss tuberculosis and lupus. Birkett says: "What is necessary in all cases of this nature is to establish the circle of evidence, namely, presence of the tubercle bacilli; definite results from inoculation; and, I think one may say, the reaction from the use of tuberculin." The bacilli were found; inoculations were positive, as was also the tuberculin test.

CONCLUSIONS.

Primary tuberculosis of the upper respiratory and alimentary tracts is not such a common condition that we can generalize or draw many conclusions from the relatively small number of cases reported, and the few that we may meet in our own personal experience. We can not help but note that many of the presumably primary infections are at some time later disproved by indications of previous or concomitant general infection, or local infection which must have been overlooked at the time of earlier examination, on account of its presence being undemonstrable. The concensus of opinion is that these infections appearing in the upper respiratory and alimentary tracts, whether primary or secondary, are very severe, and run their course in a short space of time, but that if seen and treated early in their course the chances for cure are good.

These lesions are not especially easy to diagnose, I am constrained to say, from my experience with the case whose history I have given, as the clinical picture of tuberculosis is much like that of syphilis or neoplasm. This clinical picture not being characteristic enough to prove the condition either tuberculosis, syphilis or neoplosm, we must rely upon the microscope to differentiate by histological struc- tissue, or demonstration of the organism in culture medium or ani- ture of the tissue, presence or absence of organisms in the examined mal inoculation tests. Personally, the fact that the bacillus tuberculosis is found in the removed tissue is proof positive to me of the nature of the condition. The only practical clinical test, to my mind, is the thorough pushing of antisyphilitic treatment, although I am well aware that many feel that the tuberculin test is infallible in its demonstration of the presence or absence of tuberculosis, but often the course of such infections is so brief that the test by treatment would be unwarranted, to say the least.

Could our old friend, Aretæus, the Cappadocian, have had in mind primary tuberculosis of the upper respiratory and alimentary tracts when he wrote, in 50 A. D., "The postponement of medical treatment is a bad thing, for by procrastination they pass into incurable affections, being of such a nature that they do not readily go off, if they once attack, and if protracted by time they will become strong and end only in death"?

When we consider the prophylaxis of primary tuberculous infections of these regions, we must have in mind the factor in prophylaxis of tuberculosis in general. I am fully confident that we often err when, in our converse with tuberculous patients, we do not continually keep before them the fact that they are a menace to all those with whom they come in contact, or even those who may never see them or know them, providing they do not attend properly to the prevention of the spreading of their infection. As at present, tuberculosis is only theoretically preventable, and for obvous reason will not be practically preventable for some time, it is necessary for us to consider the prophylaxis largely from the point of the condition of the locality affected and those things that are liable to increase the chances for such infection. Dismissing as not feasible, then, the general prophylaxis of tuberculosis, we must expect the presence of the bacillus tuberculosis in the inspired air of practically every individual at some time during the day, and plan, if possible, to prevent the organisms, which must be present practically at all times in the nasal and oral mucus, from infecting the membrane itself, by proper attention to nasal and oral hygiene, and by the correction of any local or general conditions which may determine these particular regions as an easy avenue of infection.

Children and adults should be instructed that danger lies in careless picking at the nose to remove the little crusts that may accumulate in the nares, and that the nose should receive as careful attention in its daily treatment and care as any other part of the body. Mouth breathing should be corrected. Foreign bodies should not be put into the nose and mouth. Promiscuous osculation should be abandoned. The use of public eating and drinking utensils should be limited. Whenever slight chronic conditions of hyperemia of the mucous membrane exist, they should receive the attention of the physician, who only should advise the douche or spray or gargle that may be needed. If all this were carried out, the result would be that systematic and complete and careful examinations of the upper respiratory and alimentary tracts would be made at regular intervals, and any suspicious conditions could be investigated at an early date.

Although none of us will hardly agree with our preceptor, Galen, who, in 140 A. D., said: "Ulcer (ἕλχος) of the lungs was less frequent than ulceration of the larynx and trachea," we must believe that ulcerations and other affections of the upper respiratory and alimentary tracts, caused by the bacillus tuberculosis, are sufficiently frequent even as primary conditions to merit the careful consideration and attention of all the men who are working toward the common end of alleviation of pain and suffering, and, better still, the prevention of those conditions that couse pain and suffering and even death.

I wish to acknowledge with thanks the assistance rendered me in the preparation of this paper, by direct help in the attention given the patient when he was in my care, or by laboratory work with the examination of material from the patient, or clerical assistance in investigation of the literature on the subject of primary tuberculosis, of the following of my colleagues. Drs. Frederick Baldwin, Fleming Carrow, George Dock, Charles B. Nancrede, Aldred Scott Warthin, A. W. Wilkinson, D. Braden Kyle, and those from whom I have received personal communications. In preparation of the paper I have consulted freely the text-books mentioned in the table of references, Nothnagel's Encyclopedia of Practical Medicine, Index Medicus, Index Medicus Novus, and various journals of medical science.

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A CASE OF SUB-GLOTTIC PAPILLOMA CURED BY LARYNGO-TRACHEAL FISSURE.
A CASE OF BRANCHIO-GENETIC CYST.*

BY THOMAS J. HARRIS, M. D., NEW YORK.

I.

Sub-glottic tumors are among the most difficult to treat and demand at times all the patience and skill that the surgeon has at his command. The following case is reported, not because it is in any way unique, but because of the unusual complications which it presented in diagnosis and treatment and with the hope that the experience gained may prove of service to some one in a similar case.

Ralph D., age 11, came under the writer's care in the Manhattan Eye, Ear and Throat Hospital last October through the courtesy of Dr. Charles A. Manson. The following history was obtained. He had suffered from measles and pneumonia, but otherwise had always been well. The family history was negative. The present trouble with his throat began in January, 1907, when his voice became hoarse and he noticed that he easily got out of breath. There was no pain in phonation and no expectoration of sputum or blood. The boy had been for several weeks attending the Tuberculosis Clinic of the Department of Health, where it was suspected that the condition might be tubercular because of a temperature which he was running. His health was, however, good and the examination of his chest negative.

Inspection by us showed a rather anaemic lad who spoke with considerable hoarseness and effort. A view of the throat was rendered difficult by an overhanging epiglottis. as well as by its pronounced irritability, leading on the slightest manipulation to repeated vomiting. The cords were seen to be healthy. On phonation, a tumor was visible, filling the anterior commissure and attached to the under surface of the right cord. This growth appeared to be solitary, red in color and not vascular. A number of attempts were made to remove it endo-laryngally. On account of his extreme timidity, crying at the least examination, this was found impossible. On October 15 he was admitted to the hospital and an attempt was made to do this under ether through the Jackson tube-spatula. Although it was easy to expose the tumor to view and to engage it in the seizing forceps, it was found that they were too light to remove more than a small portion of it. This procedure had a favorable effect on the breathing and voice. Without, however, waiting for suitable forceps, it was determined to perform a laryngo-fissure and remove the growth from without. Preliminary to this tracheotomy was deemed advisable. This was performed under general anaesthesia on November 18. Before we were ready to open the trachea, the boy stopped breathing and it was necessary to stab him through the crico-thyroid membrane. On account of the excessive oozing the removal of growth was delayed for a few days. A tracheotomy tube was introduced and the boy sent back to the ward. Marked reactionary swelling in the larynx took place and all laryngeal breathing was cut off. A week later Dr. Chevalier Jackson was kind enough to examine the larynx and trachea by the direct method. The growth was to be seen, but so surrounded by inflammatory swelling, involving both the vocal cords and the anterior wall of the larynx and trachea, that he deemed it unwise to make any attempt either by the inner or outer route to extirpate it till the reaction had subsided. This course was followed and the lad kept under observation. The laryngeal swelling gradually went down and he was again able to breath per via naturalis. Much apprehension was felt lest a permanent cicatricial deposit should be left, seriously interfering with normal breathing. At the end of two months, however, the oedema had virtually disappeared and, what was more surprising, careful examination failed to show any trace of the tumor remaining. The landmarks in the larynx were still distorted and the cords showed much swelling. It was therefore felt advisable, after consultation with Dr. W. Kelly Simpson, to introduce an intubation tube and remove the tracheotomy tube.

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*Read by Title at the 30th Annual Congress of the American Laryngological Association in Montreal, May 11-13, 1908.

This was done February 10, 1908, and excellent breathing secured. This continued for about ten hours, when suddenly he began to find great difficulty in getting his breath. He was again readmitted to the hospital and the tracheotomy tube reintroduced. The intubation tube could not be seen in the larynx, and was discovered in the stool the next morning. He was again intubated, this time with a smaller tube. This tube gave equal comfort and remained in situ for four days. When I again saw him, four days later, he was breathing perfectly, but the thread had been bitten off and there was no trace of the tube to be seen in the larynx, nor was it ever found. Inasmuch as the respiration was so good, we decided not to reintroduce the tube, but merely to keep him in the hospital. This was done for two weeks, when he was allowed to go home. The voice, which was at first very hoarse, has continued to improve and when last seen, April 18, was clear and quite strong, considering the injury which the larynx had sustained. Laryngeal examination showed the cords assuming their normal color and outline. The boy had gained in weight and appeared to all intents perfectly well.

A review of the case suggests the following interesting points: 1. The misleading effect on the diagnosis of the two symptoms complained of, viz., hoarseness and dyspnoea, which taken in connection with fever caused a suspicion of tuberculosis. This was readily cleared up as soon as a laryngeal examination was made, which had apparently been omitted up to the time he came to us. 2. The second point that impressed itself on us was what is being so generally recognized at present, viz., the practicability and usefulness of the direct method for removal of laryngeal growths, especially those situated sub-glottically or in children. We are confident that the tumor in this case could easily have been removed at the time of the original examination with a proper Mosher forceps, and thus all the danger and annoyance of the subsequent external operations avoided. The experience in this case and in other similar cases which we have seen and read of has served to demonstrate to us that the brilliant work of Killian abroad and Jackson among others in this country in the direct inspection of the upper air passages is applicable not only to foreign bodies in the trachea and bronchi, but also to the removal of benign neoplasms in the larynx itself.

3. The third point that was brought to our attention was the *danger* in cases of laryngeal obstruction due to new growths, of interference with the respiration during the tracheotomy and the *profound reaction* which may follow the hasty opening of the windpipe thereby necessitated. What was the cause of the respiratory failure here, it is hard to say. It did not appear to be due to the anaesthesia. It may have been possibly due to the mass falling into the chink of the glottis. There did not seem to be any wounding of the cords at the time of the operation, but it is evident that this had occurred.

4. Still more interesting was the way that this oedema and what looked like adhesions entirely cleared up. To all that saw the case it seemed inevitable that a web would be the permanent result of the inflammation. What existed and was taken to be a perichondritis was chiefly oedema or otherwise it would not have disappeared as it did.

5. But most remarkable of all was the *total disappearance of* the *tumor.* Without any other treatment, solely under rest secured by means of the tracheotomy tube, every vestige vanished. This is, of course, no new observation. It, however, serves to confirm the value of this classical treatment for laryngeal papilloma, which this growth, in all probability, was.

6. Reference is to be made, too, to the *loss* of the *intubation tube,* an accident which has doubtless occurred many times, but which is none the less suggestive of dire consequences.

7. Finally, mention should be made of the surprisingly *good voice* which resulted. When seen at the height of the reaction, it did not seem possible that he could ever recover at the best more than a hoarse voice.

II.

The second case is reported merely for its extreme rarity and not because it possesses any particular clinical interest. Up to 1904, when Dr. C. G. Coakley reported before this Association an extremely interesting case of bronchio-genetic cyst of the throat, there was no record in the literature of such a condition having been discovered in that locality. His case presented many symptoms of unusual interest which, for a time, obscured the diagnosis, and which are described at length in his paper. The present case can in no way be compared with this in any of its clinical aspects.

The history is as follows: I. N., aged 30, married, born in Russia, presented herself at the clinic of the Post-Graduate Hospital last January. She was the mother of three children. Family history negative. She denied any previous illness or accidents. She stated that she had no symptoms of nasal difficulty up to five months ago, when she began to be troubled with a feeling of discomfort in the naso-pharynx and dropping of mucus especially at night, when she felt, as she expressed it, "all stopped up."

Examination of the throat showed what appeared to be a mass of adenoids in the naso-pharynx. The nose was clear. A more careful examination by means of the finger gave the sensation of entering a cyst with thickened walls and filled with a tissue resembling an adenoid. The posterior wall was covered by a membrane measuring at least a quarter of an inch in diameter. No secretion of any kind was seen. The growth was removed by my colleague, Dr. Forbes, with the forceps and a specimen submitted to the pathologist for examination.

Dr. Erdwurm made the following report: "Sections show tissue to be made up mostly of lymphadenoid structure; one surface shows the normal stratified squamous epithelium of the pharynx. There are a few mucous glands, and scattered through the section, in several places, are tubules lined with ciliated columnar epithelium. Beneath this epithelium the tissue has the appearance of embryonal connective tissue, and from these characteristics the tissue removed is evidently the remains of a branchio-genetic cleft."

The specimen was also kindly examined by Dr. Jonathan Wright, who confirmed the microscopic diagnosis. Dr. Wright made the following report: 1. The surface epithelium here is everywhere metaplastic, *i. e.*, the columnar walls on the surface have everywhere become of the pavement type. Except where the surface is turned into a protected depression, where these depressions or sulci are cut across the epithelial cells are seen to be not only columnar but ciliated. This is the more marked because some of the metaplasia has gone to the point of the flat epithelium assuming intercellular bridges or presenting the appearance of so-called stickle cells.

2. There are not the usually well marked germ centers here that are characteristic of lymphoid hypertrophy.

3. There are patches of spindle-celled fibrous tissue not predominant enough to warrant suspicion of sarcoma, but more prominent than usual.

4. In a few areas of chronic inflammation there are atypical giant cells, apparently arising from the fusion of the cytoplasm of some of the large mononuclear lymphocytes of which in these regions there are many.

The clinical history of the case subsequent to the operation is uninteresting. All symptoms of obstruction disappeared and the patient was discharged.

117 East Fortieth Street.

A CASE OF PRIMARY CANCER OF THE EPIPHARYNX.

BY GOTTLIEB KIAER, M. D., COPENHAGEN, DENMARK.

The claim of this case for publication is its rarity. In 1897, Kroenlein[1] had collected 900 cases of cancer, with sixty-one cases of carcinous pharyngis; but among these only two had their primary seat in the epipharynx.

The patient is a laborer, sixty-four years old. Previous to the present time, he had always been well, except for difficulty in hearing in his right ear. He denies syphilis. During past year he has been treated for difficulty in hearing by inflation and local applications in the naso-pharynx. The condition was not improved. On the contrary, the hearing in the sound right ear became impaired. There were strong pulsations in the right ear, and a few times pricking pains darted from deep within the ear outward. At the same time the glands of the throat began to swell, first on the right side, later on the left. The patient became emaciated in spite of an excellent appetite, but he was able to work. In addition to the swollen glands and darting pains, in the last three months there has been severe right sided headache.

The patient is strongly built, but spare and with a slightly yellowish complexion. On inspecting the oval cavity, the soft palate is seen to be very much flaked with red; the whole pharyngeal mucosa is red, swollen and covered with yellowish mucus, especially on the posterior wall and in the vault. Anterior rhinoscopy shows nares of normal proportions, with good air passage. Sense of smell was acute. On the right side the cervical retromaxillary, parotid and submaxillary glands are enlarged to the size of hazelnuts or walnuts. They are only slightly sore. On the left side the condition is the same, but in a less degree. The larynx is normal. The rest of the examination revealed nothing abnormal.

I immediately concluded that the condition was one of malignant lymphoma. The greatly swollen cervical lymph glands, the comparative health of the patient in spite of his emaciation, and the slight paleness of the mucous membrane pointed in that direction. However, it was not until my next examination that I found the reason of the marked glandular hyperplasia. By posterior rhinoscopy there was seen in the vault of the pharynx an elevated, flat, dirty ulcer, with ragged and wall-like edges. It occupied all of the right side of the vault and extended a little past the median line and a little down on the posterior wall. I could not determine the exact consistency of the ulcer, as the distance was so large, and the upper front teeth were not missing. A piece was removed by biting forceps for microscopic examination. Dr. C. Riis reported as follows: "In the connective tissue spaces are seen abundant growth of numerous large cells irregularly shaped, separating the normal groups of round cells. In a few places there are indications of extension of the surface epithelium into the depth."

To be on the safe side, potassium iodide and mercury in increasing doses were prescribed, and at the same time the patient was subjected to Roentgen ray treatment at St. Joseph Hospital. Later electrolysis may be tried, but with only a small current, for fear of destroying the wall of the pharynx.

The dense network formed by the lymph vessels in this region, Waldeyer-Bickel's ring, easily explain why the glands are affected on both sides of the throat and especially on the right.

The microscopic examination showed typical cancer and the chemical picture, a man of sixty-four years, with a large, dirty, flat ulceration, with swollen, precipitous edges and inflamed surroundings, enlarged glands, severe pains radiating to the ear, is that of a carcinoma. Nevertheless, potassium iodide and mercury were given in increasing doses and Roentgen ray treatment was used possibly to alleviate the severe radiating pain and right sided hemicrania.

This treatment has been continued for three weeks. The ulceration has become clean, the mucous membrane in the pharynx is less red and swollen, but for the rest, the condition is unchanged.

I will not advise operation, and would not even if the glands in the throat were not so much swollen. Loeb (*The Laryngoscope*, 1902, p. 910), has collected all the cases published of primary carcinoma in the epipharynx, altogether thirty-nine, and in no case did an operation succeed in curing the patient.

The prognosis is pessima. Morphine alone can help the patient over the violent pain and headache that develop when the pain spreads to the cancer cranii.

A CASE OF INTRANASAL SARCOMA.*

BY H. AUFMWASSER, M. D., CINCINNATI, O.

The following case of malignant disease of the posterior nares offers some points of interest, especially in connection with the treatment which was followed, showing the value of the Roentgen rays as auxiliary agents in the surgical treatment of malignant disease.

Mrs. S., aged thirty-two, was referred to me September 12, 1903, on account of an infection of her nose. Patient had been well up to six weeks prior to the date mentioned. She began to suffer from severe headaches and was unable to breathe through the right nostril. There was no history of lues or tuberculosis. Inspection of the right nostril showed it to be filled with a hard growth which was found to be an enlarged, cystically degenerated middle turbinated bone.

This was removed by means of the snare, the operation being followed by instantaneous relief of the occluded condition of the right nostril. The headaches disappeared and the patient left for her home in Kentucky, apparently well. Six weeks later she returned with aggravated symptoms. The anterior part of the nose was found to be filled with a mass which was attached by a broad base to the anterior third of the floor of the nose. This mass bled easily upon even slightest manipulation. It looked like a granular tumor and was removed by means of the galvano-cautery snare, the patient making a prompt recovery. There was no glandular enlargement in the contiguous parts. Microscopic examination was not made. In January, 1904, patient returned, complaining of severe headaches and general malaise and suffering from frequent hemorrhages from the again occluded right nostril. Examination showed the field of the last operation as well as the remnant of the middle turbinated bone to be clean and uninvolved. At the junction of the middle and posterior third of the floor of the nose a spongy growth was found extending upward.

On account of enlargement of the posterior end of the inferior turbinated bone, no rhinoscopic view of the tumor could be obtained. There was no discharge from either frontal sinus or antrum. Examination of the urine was negative. Under cocain and adrenalin anesthesia the growth was removed by means of the cold snare and the base curetted. Bleeding, which was very profuse, was finally arrested by means of a post-nasal plug and nasal tampon. Microscopic examination by Dr. A. O. Zwick showed the growth to be a typical round-celled sarcoma. Patient came back two months later. Examination revealed a recurrence of the growth at the previous site. Again the growth was removed by means of snare and curette, the operation causing the patient to nearly collapse from loss of blood. On March 22, the patient was referred to Dr. O. Juettner for X-ray treatment.

The technique was as follows: Patient was placed in a reclining position, the head drawn backward. The whole face was covered with sheet lead. An opening was made in the lead corresponding to the location of the opening of the right nostril. A small speculum-like tube made of sheet lead was secured in the opening, exposing the interior of the right nostril. A moderately low tube was placed in front of the lead-speculum at a distance of about ten inches. In this position the patient was exposed to the rays for ten minutes at each sitting. The X-ray exposures were given every other day for three weeks. By the middle of May, 1904, the condition of the patient was found to be good, no recurrence having taken place. Six weeks later a small elevation was noticed at the site of the two last operations. Patient felt well and would not consent to any surgical intervention. In September, 1904, she came back with occluded right nostril. Examination revealed the existence of a firm growth which did not bleed readily. The tumor was removed amid considerable hemorrhage. Pathologically the tumor was the same character as those previously removed. For two weeks X-ray treatment were given every other day. The patient returned home in good condition. She was seen in November, 1904, and her condition found to be satisfactory. There was no recurrence, the sites of the previous operations being closed with firm, cicatricial tissue. The last report from the patient was received November 1, 1907. Her condition continues to be good. There is no recurrence of the local trouble.

113 West Seventh Street.

REMOVAL OF DISEASED TONSILS AND ADENOIDS TO RID THE THROAT OF DIPPTHERIA BACILLI.

BY JOSEPH B. GREENE, BIRMINGHAM, ALA.

The following report of removal of diseased tonsils and adenoid to rid the throat of diphtheria bacilli is, so far as I have been able to learn, the first recorded case. No laryngologist would think of operating on tonsils or adenoids during an acute attack of diphtheria, but after recovery, and while temporary immunity is present, it would seem a favorable time for operation. The following patient was brought to me for treatment because diphtheria bacilli were found in the throat by the health authorities, which furnished good cause for exclusion from the public schools.

Patient O. R., a boy of eight years, who had usually enjoyed good health, except for frequent attacks of sore throat, and symptoms of "mouth breathing," consulted me Nov. 13, 1907, on account of the persistence of diphtheria bacilli in his throat. Two weeks previously he had had an attack of diphtheria and was given 4,000 units of anti-toxine. Tonsils were enlarged and adherent. The crypts were open, and the tonsils showed signs of chronic inflammation. Palpation of naso-pharynx showed considerable adenoid tissue present. Patient was given a spray of bichloride of mercury, 1 to 5,000, for throat, to be repeated every four hours. Five days later another swab was taken from the throat, which showed almost a pure culture of diphtheria bacilli. Appreciating the danger of the patient to himself of having a recurrent attack of diphtheria, and the danger of infecting other members of his family, which was a large one, to say nothing of the disadvantage of being kept away from school, I advised the removal of the tonsils and adenoid. The tonsils were freed from the pillars by the Leland knife, and enuclueated by the wire snare. The adenoid was removed with a curette. Immediately after operation the patient was given, in order to increase his immunity, 2,000 more units of anti-toxine. The patient's recovery was uneventful. At no time was he more ill than patients usually are after such operations. His temperature never went higher than 100° F. Nov. 30th, nine days after operation, a culture made by the health authorities showed entire absence of diphtheria bacilli.

It would seem to me that as far as the danger of another attack of diphtheria was concerned, in this case, there was less than in operating on diseased tonsils when diphtheria had not occurred. It is a well-known fact that diphtheria bacilli are present in a fair proportion of cases when children have shown no evidence of diphtheria, especially is this the case at times of local outbreaks of this disease.

On account of the temporary immunity conferred by an attack of diphtheria, there should be no more risk incurred by operating after an attack of diphtheria than at other times. One must not overlook the visceral changes, especially of the heart muscle, occasioned by the diphtheria infection. This should influence the operator in the choice of an anaesthetic. Chloroform should never be used, and the heart should be carefully watched if ether or ethyl bromide be the choice. Nitrous oxide gas is too short in its effect for use in an operation where the tonsils are to be removed.

On account of the prompt disappearance of the bacilli from the throat of this patient, it has occurred to me that the persistence of the germs in the throats of patients recovering from diphtheria is due to disease of the tonsils and adenoids. Diseased tonsil and adenoid crypts afford an ideal site for harboring infection. Experiments have shown how promptly virulent cultures are disposed of by the cilia and normal secretion of the nose. It is my belief also that a healthy naso-pharynx, and throat, devoid of lymphoid tissue is incapable of harboring infection, as the diphtheria bacilli. It is not impossible that the persistence of diphtheria bacilli in the nose after diphtheria, come from the crypts of the adenoid, or else they belong to a species of bacilli often found in the nose which resemble Klebs-Loeffler bacilli, both culturally and morphologically, but are not pathogenic.

803-804 Title Guarantee Building.

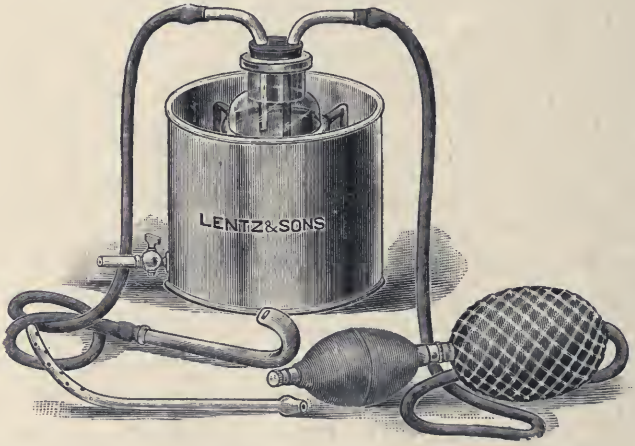
A NEW APPARATUS FOR THE ADMINISTRATION OF ETHER

BY MARY P. S. RUPERT, M. D., PHILADELPHIA.

The accompanying illustration shows a simple device for the administration of ether in operations about the mouth and face.

The apparatus consists of a glass bottle for ether which stands in a water bath. The bottle should be only half filled with ether, and the temperature of the water bath must be kept at 90-100 degrees.

The bottle is fitted with a rubber stopper, through which pass two metal tubes of different lengths. To the longer one is attached a hand-bulb, which is used to force the ether vapor out of the bottle, through the short tube. A hollow metal retractor is connected with the short tube by means of rubber tubing, and through this the ether vapor is pumped into the mouth; or if preferred, through a pliable metal nasal tube into the nose. In this way an easy and even anesthesia may be maintained by fairly steady pressure on the hand-bulb and by keeping the water bath at the proper temperature in order to vaporize the ether.



It is best to induce anesthesia in the usual way—that is, by a close inhaler, or a mask—and after narcosis is produced, change to the vapor apparatus.

The advantages of the apparatus are obvious. It does away with all forms of masks or gauge cones, permitting an even and satisfactory anesthesia without any interference with the operator.

By a careful adaptation of the relative length and width of the metal tubes and the size of the hand bulb, it is practically impossible for liquid ether to be carried into the patient's nose or throat.

The apparatus is readily portable, easy to operate and safe in the hands of the average administrator. It has met with the approval of a number of the leading surgeons and has been exceedingly satisfactory in prolonged anesthesia for cleft palate work.

132 South Eighteenth Street.

Note on a Case of Fenestration of the Anterior Pillars of the Fauces. P. Watson Williams. *Lancet*, Jan. 25, 1908.

The writer considers the condition congenital on account of:

(1) The absence of any cicatrices or unevenness in the margins of the fenestrae; (2) the bilateral symmetry of the malformation; (3) the arrangement of the strands of mucous membrane and the muscle fibres, and that they obviously correspond to the anterior pillars of the fauces; and (4) the fact although the posterior faucial pillars do not show fenestration, yet the palato-pharyngeus muscles are collected into a separate bundle of fibres on each side, with only a thin layer of mucous membrane in continuity with the lateral walls of the pharynx. Thus, in front the palato-glossus muscle forms a separate bundle, passing down to the tongue, and forms the inner boundary of a fenestra on each side, while the palato-pharyngeus forms the inner boundary of a thin web of mucous membrane.

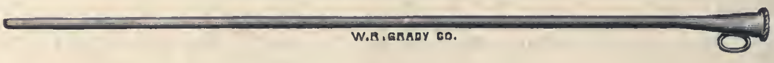
A possible explanation of these fenestrations is that the condition of the anterior faucial pillar was similar to that shown in the posterior pillar until scarlatinal angina caused the thin web of mucous membrane to ulcerate, leaving the strands of palato-glossus muscle seen in later life. Thomson.

AN IRRIGATING APPARATUS.

BY FRANK BRAWLEY, M. D., CHICAGO.

Feeling the need of a more convenient means of irrigating the nasal accessory sinuses, etc., I have arranged a simple apparatus which I feel is of sufficient value to present to this Society.

In the past we have been dependent upon the barrel-syringe, the gravity irrigator, bulb-syringe, etc. The same objections apply to all of these: the pressure is not fully and easily under control; the syringes require that one stop and refill them from a solution which must be prepared for each patient. The patient must be entrusted with the canula in irrigating accesory sinuses while the operator is refilling his syringe, and he frequently allows the instrument to slip from its position necessitating its replacement, which is often very difficult. To meet these objections I have adapted an ordinary copper compressed air tank, (A), block tin lined, with a capacity of about two gallons. Compressed air from the supply furnished by the office building enters the tank (B) through one of the valves at the top and its force is expended against the surface of the contained solution. The solution escapes through a long tube (see dotted lines A) reaching nearly to the floor of the tank and connecting with the second valve placed opposite the first at the top of the tank. An ordinary compressed air tube and cut-off (D) are used to carry the solution where desired. The cut-off I have modified by extending the outlet tube to a length of 10 centimeters with a truncated cone tip (E), ground to fit the connections on my canulae. The hand and cut-off are protected by a bell-shaped shield from solution or secretions which might run backward along the canula. The solution is kept warm by a flat electric stove against the bottom of the tank. This stove has three degrees of heat, controlled by a lever which projects from a slot in the false bottom of the tank (A) A screw plug with lever handle (C) about 3 centimeters in diameter set in the top of the tank per-



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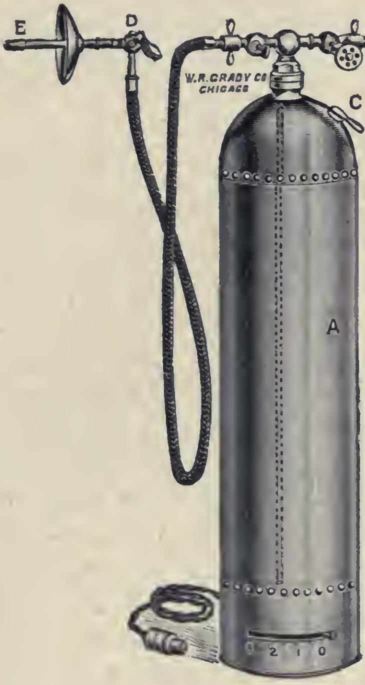
*Read before the Chicago Larygological and Otological Society, February 11, 1908.

mits of refilling and cleansing. I use a physiological saline solution, as it is preferable in its solvent properties to the usual alkaline solution, and is easily and inexpensively prepared. The apparatus was made for me by Mr. Sickler of the W. R. Grady Co..



The illustration shows the form of canula used. Two sizes are made and as these are of coin silver as many as necessary may be bent into the various curves used to reach the different sinues and then varied slightly to suit the individual case.

72 Madison Street.

UNUSUAL TERMINATION OF A CASE OF ACUTE MASTOIDITIS.*

BY A. C. MAGRUDER, M. D., COLORADO SPRINGS, COLO.

At 7 p. m. May 6th I was asked by Dr. Perkins to see a scarlet fever case in which he suspected serious mastoid involvement. Grace L., age thirteen, had been ill three weeks with a mild form of scarlet fever. Four days before I saw her (on the seventeenth day of her scarlet fever illness), she complained of severe throbbing pain in left ear and headache. Dr. Perkins was called and, finding the mastoid tender and oedematous, called me. Examination of ear showed auricle and external auditory canal normal. The tympanic membrane was highly injected and bulging. There was exquisite tenderness over tip, antrum, and zygoma. Swelling extended over the entire mastoid area and zygoma. Temperature 102°, pulse 120. No history of chill. Pulse and temperature had been normal for several days prior to this acute onset of ear symptoms.

I advised immediate parecentesis, which was done under ethylchloride at 8 p. m. Free deep incision was made through mucous membrane down to the bone, and, aside from the average amount of hemorrhage, there was no other discharge. No serum. No pus. Ear was irrigated every six hours with hot alphozone solution. At 9 a. m. the next day, May 7th, temperature was 100°, pulse 100. Tenderness and swelling over mastoid very much less, and the patient reported having spent a very comfortable night, the best in four days. The drum membrane was much less injected; the paracentesis wound had closed; the throbbing pain, which had annoyed the patient, had disappeared; and there was but little headache. The hot irrigations of alphozone were continued every eight hours. May 8th, pulse and temperature practically normal, and all of the symptoms very much improved. May 9th pain in ear and head, and swelling over mastoid and zygoma had entirely disappeared; pulse and temperature normal; membrane normal. The child was allowed to get up. Ten days later, May 19th, there were no signs of mastoid swelling or tenderness, and the child was well. She would be out except for the scarlet fever quarantine.

I have never seen a case with more typical symptoms of middle ear and mastoid involvement. I have never before seen a case clear up so quickly—leaving no trace of the trouble. I presume the result is due to opportune drainage and large Eustachian tube.

305 North Tejon street.

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*Read before the El Paso County Medical Society, Colorado Springs, Colorado.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, May 23, 1908.

WOLFF FREUDENTHAL, M. D. Chairman.

PRESENTATION OF PATIENTS.

At the opening of the meeting the secretary read a communication from the New York branch of the National Pharmacists' Association, inviting the Section to attend the meeting to be held in the city on May 28. It was moved and carried that the invitation be accepted.

Some Points Concerning the Surgical Principles Involved in the Treatment of Frontal Sinus Suppuration. By JOHN F. BARNHILL, M. D., Indianapolis.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

Frontal Sinus Diseases. PROF. ALBERT JANSEN, M. D., Berlin, Germany.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

DISCUSSION OF PAPERS OF DR. BARNHILL AND PROF. JANSEN.

DR. MYLES said that all surgeons love a bold operator, and the readers of the papers have merited our affection. After the papers read by Professors Killian and Jansen, there remained but little to be said in regard to frontal sinus technique. The only addition to the radicalism would be complete removal of the posterior superior bony walls of the sinus, which would allow the intracranial structures to join with the orbital fat in obliteration? In regard to the choice between the intra-nasal and the external methods of operation, his experince had led him to run the gamut in both directions. For a while he achieved the most satisfactory results by the external methods, and he kept these up until some predicament arose, individual and peculiar, which would cause him to resort more frequently to the internal method; then a limited number of failures in the internal method would necessitate a resort to the external operation. He believed that we should continue to devote a certain amount of special work to the intra-nasal method;

there is much yet to learn in this direction, but we are on the road to improvements in instrumentation and technique which will make it much safer, and increase the percentage of permanent cures.

It has been demonstrated in the sphenoidal cells and the antrum of Highmore that the so-called pathological processes in these sinuses are not necessarily so stubborn nor serious as they are usually considered. Very few ever curette thoroughly all of the pathological mucosa of the sphenoidal cells. Free drainage and ventilation will frequently secure remarkable cures.

Dr. Berens said that neither one of the distinguished guests had really defined whether he meant acute or chronic when he spoke of curing frontal sinus disease by the intra-nasal method, nor did he believe it was the custom of writers on this subject to do so. Every one sees many acute frontal sinus cases get well without operation, while other cases are cured by the removal of the anterior end of the middle turbinate; but we rarely see a complete cure of chronic frontal sinusitis by intra-nasal methods. It had not been his good fortune, at least, to secure complete cure of a frontal sinusitis of long standing by the intra-nasal method. The keynote to the absolute cure of a chronic frontal sinusitis is as Dr. Jansen and Dr. Barnhill had to-night expressed it—the complete removal of the disease around the basal part of the frontal sinus, all the diseased ethmoid cells and all of the ethmoid cells that can interfere with drainage from the operated frontal sinus. This necessarily often means the removal of a considerable part of the orbit, part of the ethmoid along the orbital plate of the frontal sinus. In no other way are we going to get a radical cure in these cases, excepting by resort to the open method mentioned by Dr. Barnhill, and quoted by Dr. Coakley. Even when dealing with such cases by the open method, if we leave diseased ethmoidal cells, the patients are not relieved of pain, the most trying of all their symptoms. He had seen much pain result from a diseased ethmoid cell overlooked during a frontal sinus operation that was healed by the open method.

Many acute cases get well without operation, many by mild intra-nasal methods, but he wished to register his protest against any attempt to drill through the nose into the frontal sinus. Recently Dr. Ingals of Chicago had read a paper advocating intra-nasal drilling with special instruments, but he wished to emphasize his protest against all such methods as being unsurgical, uncertain and dangerous. The keynote of success, whether it be by Jansen's operation, Killian's operation, or Luc's operation, is complete drainage, and the complete removal of the ethmoid cells which interfere with this drainage.

Dr. Felix Cohn said that he could only voice the sentiments of the preceding speakers in giving expression to the pleasure derived from listening to the papers of Drs. Barnhill and Jansen. In regard to accessory sinus disease from a surgical standpoint, we are confronted with several problems. In the first place, the anatomical and topographical relations of the sinuses are such that with our present methods of operation it is almost impossible in all cases to thoroughly eradicate the affected parts, and this holds especially true for the posterior ethmoidal and sphenoidal sinuses. We have as yet no method, for instance, of thoroughly attacking the roof of the sphenoidal sinus, and yet the only case that the speaker had observed of fatal termination due to sphenoidal disease occurred in an adult of fifty, who died of fibrino-purulent meningitis, the meningitis having been due to extension from the carious roof of the sphenoid,—a similar case having been reported by Dr. H. Knapp, some years ago, in an adult of seventy.

Secondly, in accessory sinus disease, especially of the ethmoid and sphenoid, we know that fatal terminations are rather rare occurrences; a thorough eradication of the disease requires extensive, prolonged, and severe operative manipulation. As for frontal sinus disease, we must take into consideration the cosmetic result, for even a permanent cure, with a correspondingly poor cosmetic result which cannot always be avoided owing to the prevailing anatomical conditions, would, in many cases, irreparably injure the social standing and psychic life of the patient. A further elaboration is not necessary.

The consideration of procedures for maxillary antrum disease needs hardly to be dwelt upon, as most rhinologists are agreed as to the methods. For sphenoid and ethmoid disease we have to consider two distinct methods of operation, the intra-nasal and the maxilary route, the latter recommended and elaborated by Dr. Jansen. Both of these routes, or a combination of both routes can be recommended in selected cases. A great deal can be accomplished by intra-nasal methods, as already referred to by Dr. Myles. In the surgical consideration of frontal sinus disease, it is necessary, first of all, to determine what are the diseases of the frontal sinus which require operative interference, and what method of operation we should employ. All inflammations referable to dyscrasic conditions, tubercular, syphilitic growths, malignant or malign, mucocele,—all comparatively rare occurrences,—are absolute indications for operative interference, and for these conditions there is only *one* method, a thorough external operation, whether by means of an osteo-plastic resection, or a Killian, or a modified Killian operation; we have no choice, and every patient will willingly give his consent, no matter what external deformity may result. If we exclude those diseases in which the route of operation is self-evident, we have only the following remaining diseases:

I. *Acute Inflammation of the Sinus*:—It is our experience that most of these cases get well spontaneously, without any, or with minor intra-nasal procedures, such as removal of the middle turbinated, lavage of sinus, etc. It is surprising what severe forms of acute frontal sinusitis will recover. An external operation is therefore hardly necessary to consider.

II. *Chronic Frontal Sinusitis*:—Accompanied by caries, granulations in sinus, purulent conditions, or those chronic forms of frontal sinusitis occurring in atrophic rhinitis. For these conditions we must all agree with Drs. Barnhill and Berens that there can be only one route to pursue, and that is the external route, and for such cases we fortunately have an almost ideal method in the Killian operation. Fatal terminations in frontal sinus disease are extremely rare; it is therefore our duty to carefully select our cases for operation, and only operate when either the subjective symptoms of the patient absolutely demand operative interference, or our methods of examination warrant us in assuring our patients of a good cosmetic result. A small sinus invariably gives a better cosmetic result than a large sinus. If we bear these facts in mind we will naturally lessen our operative activity and have fewer opportunities to operate, but our results will be more satisfactory, and in the long run our patients will be more satisfied.

For chronic frontal sinusitis accompanied by atrophic rhinitis, only those should constitute operative indication where either a vital indication exists or the subjective symptoms of the patient are of such a grave nature that they themselves demand the operation; or, finally, if we cannot succeed in making our patients comfortable by symptomatic or slighter methods of procedure.

In regard to the technique, the speaker would prefer the closure of the external wound in all uncomplicated cases, and as often as possible with safety to the patient, rather than the open method advocated by Dr. Barnhill. The cosmetic result is far more assured, and drainage—if the methods of Killian are strictly followed—is always sufficient to ensure a final cure.

DR. BARNHILL, closing the discussion, said that it should be the effort of the profession to get away from some of the beaten paths, and to study more closely the principles on which these operations are based. He is convinced that in some cases better and more certain results can be obtained by using a method where one can at all times see what is being done. The worst things concerning any plan of operation in which there is immediate closure of the wound is that from the time of closure one must work in the dark, and if anything goes wrong during the after treatment one is not able to correct it, and this is the cause of a certain amount of failure. He had dwelt upon the fractiousness of granulation tissue, and stated that any one who has had much experience with granulation knows that when a wound is once closed there is always much uncertainty as to the subsequent behavior of this class of tissue, and consequently much uncertainty as to the ultimate outcome of the case.

He agreed with Dr. Cohen in his agreement with what Dr. Berens had said. There are cases in which there is no successful plan of treatment except to get inside the sinus, clean it out, and then so manage the granulation tissue that obliteration of the cavity occurs.

PROF. JANSEN said that he held the same position as Dr. Barnhill, and that he agreed with Dr. Cohen, and with what Dr. Barnhill and Dr. Berens had said. He had simply described his method of operating. It was not his intention to say that this method should be employed in every case. Acute cases he almost never operates. Sometimes an operation from the inside is successful and effects a cure. Every kind of affection has its own indication for operation. He believes that he can always, or nearly always, remove the whole ethmoidal bone without danger to life; and if he understood correctly what Dr. Berens had said, he agrees with him, entering and removing the mucous membrane, and stopping on the bony plate.

When there are headaches after an operation, it is likely that some cells were not properly opened, or the sphenoidal cavity demanded more thorough treatment. He thinks that the headaches are the best indication for surgical treatment of the sphenoid sinus. He generally uses the cosmetic methods for operation, if he might be allowed to call them such. He believes in the open treatment; it is always more effectual, but he finds that the treatment of open wounds is impossible without irrigation. All the gauze, powder, etc., which he brings in contact with the wound is made perfectly sterile, and then the wound is closed. We are not working in the darkness, but are working under better conditions of healing generally. Naturally, however, there are certain instances which require other methods.

Dr. Harris moved that the thanks of the section be extended to its distinguished guests for their courtesy in coming from such a distance, and favoring the members with such national contributions.

The Use of Sodium Perborate in Laryngology and Otology.

Arthur Hartmann. *Deutsche Med. Wchnschr.*, Sept. 19, 1907.

Sodium Perborate (Merck) is a white powder which combines the properties of borax and hydrogen peroxide. In the presence of pus, oxygen is liberated and borax remains. The author speaks favorably of its use in appropriate cases. Yankauer.

Note on the Removal of an Open Safety Pin in the Œsophagus of a Child aged Five Months.

Donald R. Paterson. *Lancet*, Feb. 1, 1908.

Criticising the above communication, Dr. Peterson points out the great dangers of the method employed, although it ended fortunately. He pleads for the adoption of Killian's oesophagoscopic tube in any similar cases. Thomson.

Erratum.—On page 592, seventh line, instead of *eight* read *over one hundred*.

THE
LARYNGOSCOPE.

VOL. XVIII. ST. LOUIS, MO., SEPTEMBER, 1908. No. 9.

ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

MALIGNANT DISEASE OF THE NOSE.*

BY EDGAR M. HOLMES, M. D., BOSTON, MASS.

Occurring in the nose, a cavity so labyrinthine in structure, and even with present methods of examination so hidden from view in many of its recesses, malignant growth is frequently given an opportunity for considerable development and extension before the symptoms may be sufficient to call attention to the condition; and although the cases I report may offer nothing new, either in diagnosis, prognosis or treatment, they may, I hope, be of some service when added to many other recorded cases.

Whenever a malignant growth develops, the sooner it is removed the greater are the chances of eradicating it, and when there is suspicion of any growth being malignant the pathologist should be immediately called to our aid. In a general way, any vascular, more or less granular growth occurring in any locality within the nose should receive our immediate attention.

The symptoms associated with the early development of malignant nasal growth are found associated with many other less serious conditions. Hemorrhage may be an early symptom. General symptoms of rhinitis, as stuffiness, excessive secretion, and feeling of distention may be the only symptoms. Pain is not an early symptom, but was present in one of my cases.

When we have made a positive diagnosis of malignant growth in this region, it is often not an easy matter to decide whether or not to interfere, how extensively to sacrifice the surrounding tissue when we decide to operate, and how to alleviate, so far as possible, the suffering while the patient has to survive. Knowing that one has a fatal disease is none too pleasant, but when it is known that

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*Read before the American Laryngological, Rhinological and Otological Society, Pittsburgh, Pa., May 28-30., 1908.

that disease may produce intense pain, affect sight and smell, and inflict an almost unbearable odor, it is a condition which demands any alleviation within our power to give. If only breathing space can be for a time re-established, and pain and pressure reduced, it may be right to operate, and I find that most people prefer to submit to an operation when that is the only improvement which can be promised.

I think we all, who have to deal with malignant growths in this region, as well as those who have to meet similar conditions in other almost inoperable places, long for some form of treatment, serum, opsonic, or other, which will enable us to meet and conquer this terrible condition; but until then we must do all possible within our power to give relief.

As the locality of the disease may not only modify the treatment, operative or other, but also very materially affect the prognosis, I shall, as a matter of convenience, place the cases I am reporting in three classes. In the first class, we will consider those in which the growth is attached to the septum; in the second class, those in which the disease is restricted to the turbinal bodies; and in the third class, those cases which apparently have their origin in the accessory cavities connected with the nasal chambers. The pathological reports again classify our cases, but as I have so few to report I shall not try to thus classify them, except to give pathological records.

Of the eleven cases upon which I have operated—

Two were attached to septum.

Three were attached to middle turbinate.

One was attached to extreme anterior end of lower turbinate.

Three had their origin in Highmore's antrum, and two were so extensive when examined that I had no idea of their origin.

The pathologist reported both septal cases as carcinoma, one of the turbinal cases as epithelioma, and the other two as sarcoma, the lower turbinal case as epithelioma, the antral cases, one as carcinoma, another as enchondroma, and the third as carcinoma with areas resembling odontoma, the other two cases as adenoma and sarcoma.

The youngest patient was 17 years, and the eldest 70 years of age. The average age was 45½ years. Five were males and six were females. Three had lost near relatives with malignant growth. The others gave no such history. There was nothing about employment or habits which gave any suggestion as to etiology.

Of these cases two only are now living, and one of these, Mr. J. McN., came to me 12 years ago. He was a well developed and healthy appearing man, 46 years of age, a salesman by occupation, and with a family and personal history of almost perfect health. He consulted me on account of nasal hemorrhage which was and had been his only symptom of disease. The cause of his hemorrhage was found to be a tumor about half an inch in diameter attached to the right side of the septum, at about the junction of the cartilage and the vomer, perhaps a little more over the vomer than the cartilage. The attachment was by a pedicel about one-fourth inch in diameter. The macroscopic appearance was that of an irregular nodular, bluish red colored polyp, which bled profusely after being moved by a probe.

I removed the mass with cold snare and cauterized the base very thoroughly with electric cautery. As the pathological report was carcinoma I kept close watch of patient and at the end of four weeks there were signs of similar tissue springing from the original site. I advised removing all of the septum at this area, including about one-third inch of apparently healthy tissue. This was consented to by the patient, and under cocaine with cartilage knife and scissors I removed the cartilage, bone and mucous membrane covering in one piece. This produced a very large perforation but it was so far back that there was sufficient cartilage anteriorly to maintain the proper contour of the nose. The pathological report upon the excised portion of septum was that the tissue at circumference was normal but at site of trouble there were areas of carcinomatous tissue, and also simple granulation tissue. This man has remained in perfect health since and this may give some hope in cases of malignant growth occuring in the nose, if so situated and of such extent that they can be removed entirely.

A case which belongs to this class, so far as symptoms, diagnosis, and treatment are concerned, was that of Mrs. T., 47 years of age. She was a widow with moderate means and though well nourished had a rather careworn appearance. She had been troubled with epistaxis for about six months. She was referred to me Nov. 27, 1897, by her family physician, Dr. Geo. E. Thompson, for an attack much more severe and of several hours' duration. The hemorrhage was from the right nostril and after stopping the flow of blood with a cotton plug I found that it was coming from a tumor about the size of a pea, rather nodular and vascular, attached to the septum anteriorly at about the location so often found irritated and abraded by picking the nose.

I removed the growth with cutting forceps and cauterized base with electric cautery. The excised portion was reported by the pathologist to be carcinoma. I requested patient to visit me for inspection but she did not come again until 5 weeks later when there was again hemorrhage. At this time at the posterior border of the operative area was a bluish red tumor about the size of an apple seed. I removed the septum for about a quarter of an inch about the diseased area, removing slightly more cartilage than perichondrium and mucous membrane, so that these would cover cartilaginous border of perforation made. There was comparatively rapid healing and no return of the growth at the end of 14 months, the last time I saw her. At about this time she removed to Maine where she died 18 months later of what was diagnosed as carcinoma of the uterus. There were no symptoms of any nasal disease during this period.

The next case is in a class much more formidable, due to location of origin, and extent of involvement. Mr. C. was referred to me by his family physician, Dr. Frame of Rockland, Mass., for a bleeding polyp of the right side of nose. He was a well developed and nourished man of 37 years of age, and his only symptoms were stuffing and bleeding of the right side of the nose, and some pain neuralgic in character over right side of head and at occiput. Nasal inspection showed a livid colored growth filling nares from about one-half inch inside anteriorly to about one-third inch from posterior choana. The least probing was followed by profuse hemorrhage. I removed piece of anterior end about size of hazel-nut for examination and the report from pathologist was that we had a spindle-celled sarcoma. Hoping that perhaps the attachment might be to middle turbinate and nowhere else, I advised immediate operation. The patient dreaded to undergo the same and deferred operation for about three weeks, when the pain became so severe that he sought any relief. At this time the growth had appeared at anterior nares, and there was distinct exophthalmos of the right eye. Under ether I removed the greater mass of growth with middle turbinate, but I found that it had filled ethmoid, and had pushed through cribriform plate. The case was of course hopeless, and I did not try to do more. Fortunately there was only one more week of suffering. This case illustrates how rapidly these growths can advance and how soon they may get beyond relief.

Case second in this class is Mr. L., who was referred to me by Dr. Tirrell of So. Weymouth, Dec. 7, 1897. Mr. L. was 62 years of age, was a wiry, rather small and somewhat anaemic man. He had always led an out-of-door life, His father died of pulmonary tuberculosis, his mother of cancer. There were then three living brothers, and one brother and one sister dead.

He had been in perfect health until about three years before consultation. The first symptoms were those of a cold in the head.

This symptom in various intensity had remained and the last weeks there had been pain. At first there was a pressure as of something pushing on nose, but lately considerable pain in nose and right eye. The right side of nose was pushed outward and a vascular nodular tumor apparently attached to right middle turbinated area filled the whole right nasal chamber. This bled very easily and there was considerable hemorrhage following a careful use of the probe.

Five days later under ether I removed with a hooked knife the middle turbinate with the attached tumor which was fully the size of a pigeon's egg. The inner wall of antrum had been pushed outward as had also the orbital plate. A specimen of this growth was examined at the pathological department of the Boston City Hospital, and was found to be carcinoma. This man has had no recurrence and Dr. Tirrell reports him as a healthy man to-day, 72 years of age.

The third case in this class was a Hebrew girl 17 years of age. She first came to me complaining of some pain in the right side of the head and stopping of the right side of the nose. She was at this time fairly well nourished and developed but she said she had lost considerable weight.

Under cocaine, anterior inspection of the nose showed a polyp-like but vascular mass, apparently in the naso-pharynx. This was shown by post-nasal mirror to practically fill the right side of the naso-pharynx.

The following day I removed the tumor with cold snare and cauterized the base with electric cautery. The growth was rather nodular and vascular and about three-fourths of an inch in long diameter and one-half inch in other. The pathological report was that we had a myxofibroma, and not a sarcoma as we had thought.

In three weeks there was another growth in all appearance like the first. I removed this together with the posterior two-thirds of the turbinal body.

The pathological examination of this specimen showed myxomatous and granulation tissue.

About four weeks later patient consulted me at my office as I was not then on duty at the City Hospital. There was now exophthalmos and complete blocking of the right side of the nose and naso-pharynx. I referred her back to the hospital and Dr. Leland removed a specimen for examination. This time it was reported that she had a rapidly growing spindle-cell sarcoma. The patient was admitted to hospital and Dr. Munro performed the Cheever operation, followed by death the next day. An autopsy could not be obtained but the operation showed that the process had extended into antrum, ethmoid, sphenoid and orbit.

John W., a robust man of 51, with an excellent family history and a perfect personal history except for children's diseases, consulted me February 11, 1903, for a painful and obstructive growth in anterior portion of nose. This he says to his knowledge he had had for about a year, but pain had been present about three weeks.

Examination showed a greyish red irregularly shaped tumor about 1-3x1-8 inches attached to anterior end of the right lower turbinate. The surface towards the septum was abraded and showed signs of ulceration. This was classified by the pathological department at the City Hospital as carcinoma. Under cocaine I removed the growth with considerable of the surrounding tissue. I adjusted and sutured edges of wound but on second day they pulled apart. The wound, however, was entirely healed at the end of the month. About three months after operation the patient began to have pain, and what he described as a sensation of pressure in the head. He slept poorly and lost weight rapidly. His symptoms increased and he finally died at the end of four months, just seven months after operation. Dr. Mahon, who saw patient the last few weeks of his life, reported that there was finally paralysis of whole left of the body and almost total blindness before death. Relatives refused autopsy so we can only reason by symptoms that there was probably extension into cranial cavity through the lymphatic or venous channels.

On Oct. 3, 1903, Mr. J. C. M. consulted me for a severe neuralgic pain in right cheek and eye. This had existed for five weeks but was increasing in severity and frequency of attacks. For the few days previous to examination, the pain had been practically constant. Mr. M. was 53 years of age, weighed some 220 pounds and had the appearance of one who had been suffering. His pulse was 108 and his temperature was normal. His history, family and personal, was excellent. The right eye was apparently slightly prominent. The conjunctiva was injected. The vision was normal. On the right side of nose the mucous membrane was much inflamed, and there was considerable pus in the middle fossa. The right antrum was much more opaque than the left. After passing trochar I tried to cleanse antral cavity, but very little solution came from the ostium. A probe passed through trochar gave the sense of entering some pulpy material. Radical operation was advised but patient declared he would die before he would take ether. I saw him again two weeks later and at this time there was no doubt about the exophthalmos. There was a brownish red polyp in the middle fossa. A small piece of polyp was removed for examination and found to be carcinoma. The condition became rapidly worse and at end of four weeks there was total blindness which lasted nine days, when there was sudden death. There was no examination of the eyes after my second examination and yet I believe the carcinoma had extended into orbit and probably into cranial cavity.

On Oct. 11, 1906, Miss L. H. consulted me on account of nasal pressure and inability to breathe through nose. She was 30 years of age and poorly nourished, of a sallow complexion and a constant mouth breather. The first important fact in her past history was stuffing and tinnitus in left ear two years before. There had been plugging of nose about the same time. This had grown worse and about a year before consulting me she had been operated upon under ether at some hospital in New York. She could not tell the name of hospital or the surgeon who operated upon her.

Examination showed the right side of the nose to be filled with pus and polypoid tissue. The left side contained much thick foul pus and a very vascular kidney colored polypoid growth. A similar growth filled the naso-pharynx, pushing the left side of the soft palate forward. There was a small cicatrix in the left canine fossa.

I advised the patient to go to the hospital where I could operate upon her immediately, but this she did not do. On November 22, over five weeks later, she again came to my office. There was now left exophthalmos and considerable pain, and she was willing to undergo an operation. The disease seemed so extensive I did not give a very good prognosis, and she did not appear at St. Elizabeth's Hospital until December 7th. I now found her to be suffering much pain. She had lost much weight, the pulse was weak and there was slight elevation of temperature. She was now determined to have something done. Under ether I made incision under the left lip from anterior border of canine fossa as far back as the second molar, the cheek was dissected to above the zygoma and to the infra-orbital foramen and what was left of the necrotic anterior wall of the antrum was removed. Through this opening was removed the growth which filled the antrum, the ethmoid, and the sphenoid cells, the posterior portion of left orbit as well as the whole left nasal and naso-pharyngeal cavities. The patient never thoroughly recovered from the ether, and died the night following the operation.

Dr. Leary who examined the growth reported it to be an endothelioma.

The third in this class was Rev. Dr. P., 70 years of age. He was referred to me by Dr. Darling for nasal obstruction and discharge from the left side of the nose. I first examined him March 18, 1907. He was a well preserved man for one of his years and except for prostatic trouble had been in good general health. Examination showed a very vascular pulpy growth about size of a cherry and apparently attached between the middle and the lower turbinate at usual ostium of the antrum. Trans-illumination showed much obstruction to light on the left side.

I advised immediate operation, fearing malignancy and hoping by performing a radical operation upon the antrum to perhaps eradicate the disease. As the patient had much church work which he had promised to perform, he put off operation until June 6th, when the tumor nearly filled nose and naso-pharynx. I was able by removing lateral wall of antrum to clear out that cavity, and then to remove through naso-pharynx the detached growth, which was the size of a goose egg. Dr. Mallory reported tumor to be carcinoma with areas of odontoma. So far as possible I removed all infected tissue and after the operation the patient quickly rallied and had no symptoms until the last of August, when there was again a very rapid development of the growth. As there was much distress from this second growth and as the patient very much wished a few more weeks of life to complete certain work he desired any possible relief, and Sept. 5, he was again operated upon. There were after last operation several weeks of comfort. In November there were signs of a return of the disease and death came December 16, 1907.

Mrs. L. G., a poorly nourished, anaemic woman, 34 years of age, consulted me Jan. 8, 1901. Her father was living, her mother died of hemorrhage from the uterus. Her first symptoms began eight years before when she had trouble about breathing through right side of nose; there was also considerable nasal secretion. Her family physician had removed considerable flesh from the right side of the nose which he said was a polyp. Several times there had been operations upon the nose. These gave temporary relief. The last operation was about four months before coming to me. At this time there had been profuse hemorrhage and very little was accomplished. There had been much loss of weight and strength during the previous year.

The right side of the nose was filled with a brownish bluish red mass which had extended into the naso-pharynx sufficiently to block the left side.

Under cocaine I removed much of the mass from the right side of the nose and the entire mass from the naso-pharynx. The growth had entered or was in the antrum, filled the attic, was attached to lower turbinate and it was impossible to learn its origin. Pathologically it was round-cell sarcoma.

As patient lived in a distant village I did not see her again but a sister wrote me the following: "My sister was given much relief by your operation for about eleven or twelve weeks when there was a recurrence of her old symptoms. She grew quite rapidly worse and died Nov. 19, 1901. After she found she had cancer she said she would try to do no more."

This case was likely one of simple polyps at first and was operated upon several times for that condition. There seems no way of judging whether there was any connection between these and the first tumor which was sarcomatous.

Mrs. E. M. G., a well nourished and healthy appearing woman, 53 years of age, consulted me March 7, 1904. Her mother died of cancer of breast at 61 years of age. One sister died of uterine hemorrhage at about 46 years of age. Two brothers and three sisters were living and in good health.

Mrs. G. was the mother of three healthy children and had always been in excellent health herself until about one year before consulting me. Her first symptoms were those of simple rhinitis. These gradually increased until at end of five months she consulted a physician in Philadelphia. He told her she had a bad ozaena and gave some oily spray which she used for about three months. The symptoms gradually increased, there was inability to breathe through the nose most of the time, and at times a severe heavy pain over the eyes and at occiput.

For ten days there had been more or less nasal hemorrhage.

Examination showed a liver colored nodular growth filling both nares and pressing soft palate forward. The lower edge was visible in pharynx below palate.

I removed a section for pathological examination and Dr. Mallory reported it to be adenoma. There was such an extension of disease that prognosis was exceedingly poor, but patient wished to be relieved of nasal obstruction if but for a short time.

Under ether the nasal cavities and the accessory cells were cleared so far as possible but the growth had filled every space.

For six weeks patient was very comfortable when the right side of the nose became plugged. There were a few hemorrhages, but not of severe type until July 1, when there was a severe hemorrhage from mouth, and death followed before surgical aid arrived.

The study of these few cases shows how rapidly these nasal growths, whether carcinoma, endothelioma, or sarcoma, may progress, how they push into and fill the labyrinth of sponge-like cells of the ethmoid and the sphenoid, how liable they are to break down the base and enter the floor of the cranial cavity, and how extensive they are liable to be when first the patient consults a physician.

In preparing these reports I have been surprised to find how frequently growths in the nose which I feared might be malignant from the general appearance were reported to be benign by the pathologist.

531 Beacon St.

THE TREATMENT OF FRACTURES AND DEPRESSED DEFORMITIES OF THE NOSE BY A NEW METHOD WITH THE USE OF A COMBINED BRIDGE AND INTRA-NASAL SPLINTS.*

BY WILLIAM WESLEY CARTER, A. M., M. D., NEW YORK CITY.

It is not due to lack of appreciation on the part of the writer for the excellent operations devised by several men for the correction of deformed noses, that a review of their work is not attempted, but rather to a lack of space in this short paper, which is intended chiefly to bring to your attention a practical method for retaining the parts of the nose in their proper position until union has occurred after fractures, both accidental and operative, the chief object being to prevent depression of the bridge, and to preserve the integrity of the nasal passages. It is intended, therefore, to be complementary to the various operations involving the fracture and mobilization of the nose for old deformities, as well as recent accidental fractures; and it presumes to fill a long felt want; namely, that of a splint that will exert pressure in such a manner that the nasal tissues, once placed in proper position, will be held so until union has occurred.

In looking over the text-books dealing with this subject, I have been impressed by the lack of confidence which the writers show in the methods they advise for immobilizing the nose after fractures, and in correcting depressed deformities. The devices in use for this purpose may, for convenience, be classified as: (1) Extra-nasal. (2) Interstitial. (3) Intra-nasal.

Of *Extra-nasal* appliances, those most frequently advised are plaster strips drawn across the nose and attached to the cheeks, a small roller bandage being placed on either side of the nose. This method, or some slight modification, is recommended in almost every text-book on surgery. Some of these authors, however, admit its inefficiency and the uncertainty in results attending its use. The chief objections are: (1) It is impossible to immobilize the part by attaching adhesive plaster to the skin, which is movable. (2) The plaster presses down upon the nose and tends to produce or increase any tendency to depression. (3) This method of treatment takes no account of intra-nasal conditions. (4) The results obtained are very uncertain.

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*Read before the Section on Laryngology and Rhinology of The New York Academy of Medicine, April 29th, 1908.

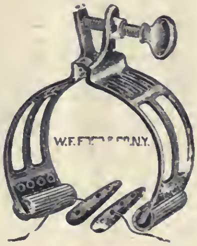
Practically the same objections may be raised against the various forms of splints or moulds attached to bands to be worn around the head. It is impossible to adjust them so that they will not slip, when they may do more harm than good.

Interstitial measures include such expedients as Martin's bridge, bridges made of celluloid, hard rubber, silver, etc., introduced under the skin. The disadvantages of a foreign body under the skin are unquestioned. It is the common experience that they slough out. On the other hand, in moderate degrees of depressed deformity, and especially where the nose is not too broad, the subcutaneous injection of paraffin is very satisfactory. It is also useful as a supplementary procedure to operative measures. It is reasonably certain that hard paraffin is neither absorbed nor organized, but is encapsulated, and remains permanently in situ if properly injected. Ulceration and expulsion of the mass has occurred in rare instances, but never to the writer's knowledge when injected into the tissues of the nose. On general principles, however, it is far preferable to correct a deformity by rearranging the natural tissues than by filling in the irregularities by the introduction of a foreign substance.

Intra-nasal appliances for the support of the bridge in the treatment of depressed deformities, and as a preventive of impending depression, are the most common of all methods of treatment. A brief consideration of the architectural structure of the nose will show how ill adapted are such means to the mechanical conditions to be overcome. The nasal cavity may be compared to a truncated cone, with apex pointing forward. The roof of the nose, if prolonged forward, would meet the level of the floor at an angle of about 70 degrees, therefore any object, such as a splint that could be passed through the anterior naris, the vertical diameter of which is only three-eighths of the distance from the middle of the nasal bone to the floor of the nose, could not possibly exert any lifting force upon the dorsum, but on the other hand would, by its horizontal pressure, drag the dorsum downward, thus increasing the tendency to flattening. This applies especially to compressed cotton splints, the horizontal pressure of which is considerable. An additional disadvantage is that the patient is forced to breathe through the mouth.

In regard to the operative treatment for old depressed deformities, those cases present the most favorable operative possibilities where there has been little or no loss of tissue, as in those resulting from trauma. Old syphilitic cases are inoperable, and atrophic rhinitis cases are difficult, and the results uncertain on account of defects in the development of the nasal bones, the extensive absorption of all the tissues and the increased dangers of infection from the purulent secretions.

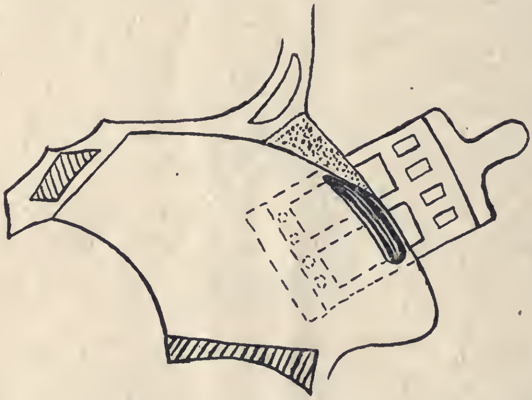
In operating there must be thorough mobilization of all the nasal tissues. This can be accomplished with the Adams forceps, and by using the chisel either from within or from the outside of the nose. Where the nose is particularly broad and flat, a portion of the nasal processes of the superior maxillae may be chipped off and used in building up the arch. Normally this process forms about one-half of the nasal arch, and according to Berens the grain runs upward and forward, so that there is no danger of the split running into the orbit. The nasal duct must be thought of, but according to the observations of the writer upon a large number of skulls, this duct, which runs downward and backward corresponding to a line drawn from the inner canthus to the first molar tooth, is placed five-eighths of an inch behind the anterior border of the nasal process of the superior maxilla. It is, therefore, safe in the ordinary operation.



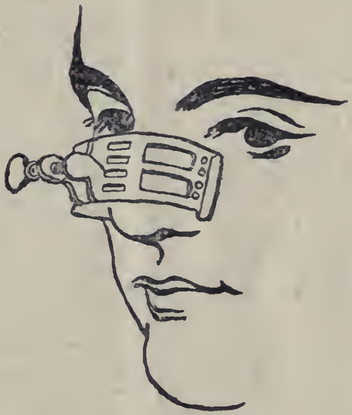
In most flat-nose cases the dorsum is held down by the shortened septum. To overcome this difficulty, I have devised a plastic and sliding flap operation that will permit of the septum being lengthened without leaving a perforation. This will be described in connection with one of my cases.

The special instrument to which I wish to call your attention consists of a bridge made of steel, and as light as is compatible with strength. The bridge is formed by two curved, fenestrated wings two and one-half centimeters wide, and joined by a hinge. The distance that these wings can be separated is regulated by a thumb-screw. The edges of the wings diverge to correspond to the shape of the nose, they are padded with rubber, and near the margins are small holes which permit of additional padding of gauze being stitched on. The second part of the apparatus consists of two narrow hard rubber splints, perforated by four small holes.

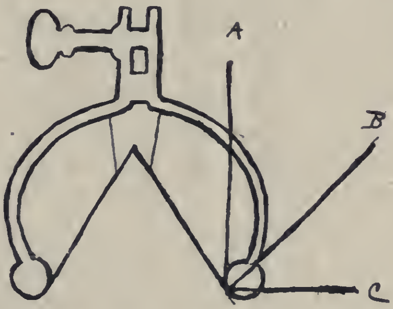
All the precautions necessary for an aseptic operation are observed, and the patient is placed under the influence of a general anaesthetic. Assuming that the nasal tissues have been thoroughly mobilized, the application of the apparatus is as follows: No. 14 iron-dyed silk is passed through one of the perforations in the splint and knotted, (the hole is selected according to the distribution of the lifting force desired), the other end is threaded into a large curved needle, this is passed from within the nose through the dorsum; we should endeavor to perforate the fibrous, triangular interval between the upper lateral cartilage, the lower lateral cartilage and the septum, and near the latter. The roof of the nose is thin and very easily perforated. The splint is now drawn into the nose and adjusted to the roof. This process is repeated on the other side. The bridge is then applied and the wings adjusted with the thumb-screw to give the proper support to the base of the nasal triangle. The sutures are now run through the fenestrae of the bridge immediately above their exit from the nose and drawn tight enough to lift the dorsum into its proper position and reduce the deformity (a slight over-correction is to be preferred), the sutures are then tied together over the hinge of the bridge, using only sufficient tension to support the dorsum. The apparatus is automatically held in position, and there is no tendency to displacement;



it should be worn for a week or ten days, or even longer; during this time the patient should remain in bed. In fractures of the nose, union occurs more quickly than in any other part of the body, in uncomplicated cases there is fixation in eight days and bony union in a fortnight. Since practicaly all fractures of the nose are compound fractures, in my opinion the patient is subjected to no additionai risks from infection by the introduction of a sterilized silk suture through the dorsum. This view is borne out in the only two cases that I have had the opportunity to operate upon by this method.



The mechanics of the apparatus may be illustrated diagrammatically:



The line (A) vertical to the base of the nasal triangle represents the downward pressure of the bridge, produced by the tension of the sutures on the dorsum. The horizontal line (C) represents the pressure exerted horizontally by the wings and controlled by the thumb screw. The mean direction of pressure (B), therefore, that is actually applied to the base of the nasal triangle bisects the angle formed by the vertical and horizontal lines, and gives us the proper support at the base, while the lifting force is applied to the apex through the sutures attached to the intra-nasal splints. The combined action of these forces, therefore, would tend to construct a symmetrical nose.

The instrument was developed after thorough experimentation on the cadaver, and has been used with satisfaction on the following cases from Drs. Knight and Smith's clinic at the Manhattan Eye, Ear and Throat Hospital.

Case I. The first patient is a pugilist, 21 years of age, of good family and personal history.

Three years ago, while jockeying in a race, he was thrown from his horse; falling on his nose, he fractured it. Following the injury his nose was flat and he was unable to get the slightest amount of air through it.

Examination showed a broad, flat nose. Both nares were completely obstructed by the thickest septum I have ever seen.

On January 23d, I did a submucous resection of the septum and found an unusual condition: the septum was double, consisting of two irregularly parallel layers of cartilage and bone, separated by an interval filled with connective tissue. On account of synechia the elevation of the mucous membrane was difficult; I succeeded, however, in removing the obstructing cartilage and bone with my punch forceps, giving a clear nasal passage without perforation of the septum. The nasal cavities were packed with sterilized vaseline gauze, and the case progressed satisfactorily.

On January 28th, five days after the first operation, the patient, having been properly prepared, was etherized, and the following operation performed: By using the padded handle of a mastoid curette and mallet externally, and the chisel and Adams forceps internally, the nasal bones, which were separated and overriding the nasal processes of the superior maxillae, were thoroughly mobilized, and the ridge of the septum, left after the submucous operation, was separated from its connection with the vertical plate of the ethmoid: this process is homogeneous in structure, and should not be fractured, as the split is as apt as not to run into the cribriform plate. The septum, following the submucous operation, was found lax enough to permit of the dorsum being raised. There was some backward displacement of the lateral cartilages at their junction with the lower edges of the nasal bones, so I introduced a Miles rectangular septal knife, and cut through the connective tissue at this point, enabling me to lift the cartilages into their proper place.

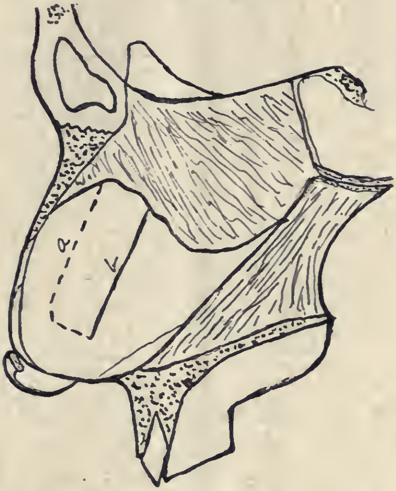
For bringing the parts into their normal relations and retaining them there until union had occurred, I used the apparatus previously described.

The nose was irrigated twice a day with Dobell's solution, and was kept lightly packed with vaseline gauze.

The bridge was removed on the eighth day, the suture holes closed promptly and without a noticeable scar.

The result was very satisfactory both from a functional and aesthetic point of view.

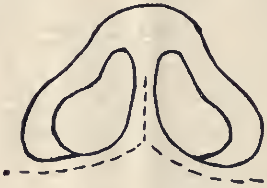
Case 2. The second patient is a man, of good family history, and no history of venereal disease. He has suffered with atrophic rhinitis since early childhood. The crust formations have always been abundant.



The nose was broad and flat, almost on a level with the face. The nostrils were broad and shallow, the alae being very widely separated. The nasal cavities were very roomy and covered with crusts. The inferior turbinates had disappeared and the middle turbinates were very small. On palpation no nasal bones could be discovered, and the slight elevation of the nose was due almost entirely to the nasal processes of the superior maxillae, which were widely separated. Altogether the case presented about as hopeless an aspect as I have ever seen. The local and general conditions at this time precluded the possibility of an operation.

He was put upon tonic treatment, was instructed to irrigate the nose three times a day with salt and soda solution, and three times a week the mucous membranes of his nose were thoroughly rubbed with 25 per cent argyrol solution. At the end of four months the crust formation had ceased, and the nasal conditions were as nearly normal as I could hope to get them; so I decided to do the following operation on April 3rd. The face and nose were aseptically prepared, and the patient etherized.

The septum, which was entirely too short to admit of raising the dorsum, was first subjected to the following procedure. Through a button-hole slit I elevated the mucous membrane on the left side of the septum. With a sharp-pointed bistoury, beginning at the anterior edge of the vertical plate of the ethmoid, I divided the *cartilage* and the *mucous membrane* of the other side at a high level, and the *mucous membrane* of the left side at a much lower level, this leaving a long flap of mucous membrane attached to the upper segment of the septum, which was intended to fall into the interval between the segments of the septum and prevent a perforation when the dorsum was raised.

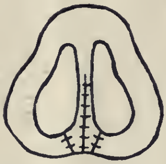


The fore-part of the septum was lengthened in the following manner: Downward from the center of the septum, an inverted Y-shaped incision was made, separating the columnar cartilages and continued under the floor of either nostril, making two flaps which were brought together in the median line and sutured with fine silk, thus doubling the length of the septum and raising the tip of the nose. The incision in the floor of either nostril was then extended under the alae, liberating them so that they could be brought toward the median line and sutured, thus narrowing the nostril and producing a shapely nasal orifice.

An effort was then made to reconstruct the bony framework of the nose. A small incision was made on either side of the nose over the nasal processes of the superior maxillae; by using a chisel and moving the tissues up and down, I succeeded in chipping off quite a strip of bone on either side, to be used in building up the nasal arch. The nasal bones had completely disappeared from atrophy. With the Adams forceps, one blade of which was covered with rubber to protect the skin, I worked these pieces into position and thoroughly mobilized the dorsum of the nose. The nasal bridge and splints were then applied. The nose was irrigated twice a day with Dobell's solution, and lightly packed with vaseline gauze.

As I feared, on account of the attenuation and low vitality of the mucous membrane of the septal flap, it partially sloughed, leaving a perforation.

When the bridge was removed on the seventh day, the improvement in the contour of the nose was marked, and the result much better than we had expected. The intra-nasal conditions were equally improved, as the cavities are far less roomy; this, no doubt, will exert a beneficial influence on his atrophic rhinitis.



The permanency of the improvement in this case depends upon the arch constructed from the nasal processes of the superior maxillae, the dorsal segment of the septum, and the lengthened anterior portion of the septum.

In conclusion, I will say that the instrument has the great advantage of restoring the function of the nose as well as its contour by a re-arrangement of its parts without the introduction of foreign substances into its tissues.

Its efficiency depends upon the principle that the best way to correct a deformity is to reverse the direction of the force that produced it.

Note.—The improvement in both cases has remained to date, August 25, 1908.

.69 West Fiftieth street.

SOME OBSERVATIONS ON HYPERESTHETIC RHINITIS (HAY FEVER) WITH SUGGESTIONS FOR ITS RATIONAL TREATMENT.*

BY OTTO J. STEIN, M. D., CHICAGO.

My observations on the study of hyperesthetic rhinitis, or so-called hay fever, lead me to the belief that this much misunderstood and much mooted subject is not so intricate as many authors would have us believe.

It will be impossible at this time or in such a paper to undertake to discuss each and all of the various theories that have been advocated in the explanation of the classification of this disturbance. My remarks at present are but the expression of a few observations I have made from the study and treatment of a great number of such cases.

In order for you to understand my position as to the classification of this disorder, I wish to say at the outset that every synonym applied to this affection other than hyperesthetic rhinitis should be rejected, on the grounds that they are misleading and confusing, and because the latter more correctly states the true condition present.

The writer believes this disorder represents a hyperesthesia of the trigeminal nerves, created by the instability of the body fluids and manifesting itself as a rhinitis with various reflex phenomena. There is some internal factor at work undermining and lessening the stability of the nerve tissue, and that factor I believe to reside in the fluids of the body. This thought has given birth to the many opinions expressed by different observers and investigators in their uric acid theory, intestinal toxic theory, anemia theory, saliva theory, etc. What is called the idiosyncrasy of the patient is nothing but a perversion in the metabolism, whereby some one or several of the fluids of the body become sufficiently changed from their relatively normal composition, so that whatever nerve tissue comes under its influence becomes susceptible to irritation. Thus is furnished the first element necessary for the manifestation of the disease. The common belief that this hyperesthetic condition is created by a general neurotic temperament becomes untenable from my viewpoint. Many authors maintain that such a condition is absolutely essential to its origin. But I am not alone in having observed cases that were phlegmatic in all but their hyperesthetic fifth nerve or some other special nerve tissue. Furthermore, the possibilities of developing a general neurotic disturbance as a consequence of a persistent and recurring hyperesthetic rhinitis becomes evident to many physicians who suffer themselves from this malady. So I do not hesitate in saying that the general neurotic manifestation, so evident in many of these sufferers, is the offspring and not the parent of this disorder.

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*Read before the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., 1907.

With the susceptibility established, the second element, in the form of an external excitant, like dust, pollen, a draught, bright light, cold, pressure spots within the nose, etc., readily completes the circuit, and the disorder is manifest. Eliminate either one of these two elements, and the syndrome of symptoms so characteristic of this affection is prevented.

The second or exciting element must not necessarily enter the nostrils to set up an irritation. Any place where there are branches and terminal filaments of the great fifth nerve may be the sensitive area. A bright ray of light entering the eye may irritate an individual with hyperesthetic ciliary nerve filaments and precipitate reflex symptoms in the nose. A draft of air from an open window or door, or from an electric fan may irritate the terminal filaments that go to the side or back of the head, and there immediately results these same reflex symptoms. In another individual some of the terminal branches of this nerve within the nose constitute the hyperesthetic area, and an irritant applied there, like a septal ridge, dust or pollen, calls forth symptoms of the disorder. Owing to the nose furnishing the greatest area for the distribution of the filaments of the first two trunks of the trigeminal nerve, it is here we most commonly find areas of irritation.

If in a patient subject to this disorder we subject that particular branch or filament of his fifth nerve to irritation, we produce experimentally all the symptoms of the disorder, irrespective of place or season. I have already shown this in the experiments made in 1904 with the toxin of rye pollen, and reported in a communication read before the Chicago Medical Society , February 22nd, 1905 (published in *Medicine*, April, 1905).

Aschenbrandt, in 1885, showed by his experiments the susceptibility of the fifth nerve to irritation. He exposed in animals the spheno-palatin ganglion, and by electrical stimulation observed pronounced swelling of the cavernous tissue of the turbinals, with hypersecretion.

Treatment: In the treatment of these cases our first thought must be directed towards the cause of the patient's susceptibility. From my prefatory remarks, it will be seen that this cause resides within the fluids of the body, hence our search for the particular condition that has brought about the individual's susceptibility must necessarily partake of both physical and laboratory examinations. The condition of the gastro-intestinal tract, with its dependent organs, must be investigated; the blood and urine examined, not only once, but several times. As all this demands considerable time, the information should be obtained somewhat in advance of the usual periods of attacks. Having thus before us an average analysis of the patient's condition, we may direct our treatment intelligently in the direction for the correction of any gross deflection from the normal. In some cases the acidosis will demand an antacid, like carbonate of lithium or bicarbonate of sodium. Faulty assimilation and elimination must be corrected by a regulated diet, proper hygienic surroundings and a sufficient amount of exercise in the open, as well as by the aid of a few well chosen drugs. As an eliminant I consider sal-hepatica both agreeable and efficient. It is claimed to contain, in addition to the salts found in the European "bitter waters," lithia and phosphate of sodium. Bishop's practice of administering acids early in the morning and at night, in order to lessen the alkalinity of the blood, thereby freeing it from uric acid, is good practice, and of benefit in those cases where the nerve susceptibility is caused by an excess or the retention of uric acid. During an attack I have secured the most satisfactory results from the employment of a tablet of morphine and atropine. Bishop's formula contains 1-12 gr. of the former and 1-600 gr. of the latter drug, in addition to 1-6 gr. caffeine.

The second part of the treatment is concerned in eliminating the external irritating element or prohibiting its perception. As already pointed out, the causes at work here vary even more than those concerned in the predisposition.

The exclusion of the irritant, if it be dust, pollen, etc., by the use of nasal filters or change of habita, is beneficial in selected cases. The correction of irritating intra-nasal causes should be undertaken where indicated. The topical application to the nasal mucous membrane of remedies capable of relieving the unusual sensitiveness of its nerves is admissible when properly selected and applied. There are two classes of remedies used here: those producing a hyper-irritating or caustic effect, like formalin, chromic acid, chloracetic acid and electro-cautery, and those producing an anesthetic and ischemic effect, like cocain and adrenalin preparations, and intraneural injections. It is of this latter method I wish to speak particularly.

Intraneural injections have already been used for the purpose of anesthetizing a field for operation, and they have also been employed in the treatment of neuralgia; but, as far as I am aware, they have never been employed in the treatment of hyperesthetic rhinitis until I made my first injection about a year ago (1906). I have used alcohol for this purpose, following the suggestions of Schlosser in the treatment of neuralgia.

In order to prevent the action of most of the external irritating elements, it is essential to the success of this form of treatment to inject the nerves as near their central ends as is consistent with safety and accessibility. This can be done in most cases within the nose. By referring briefly to the distribution of the fifth nerve, the various avenues open to irritation and their approach for the purpose of injection can more readily be understood.

The nose and its sinuses are supplied with sensation through the medium of the great fifth or trigeminal nerve, or more specifically speaking, through its first and second trunks.

This nerve supply is best grouped into an anterior and a posterior group. The anterior group is represented by the nasal nerve, a branch from the first trunk of the fifth nerve, or the ophthalmic. This branch arises from the ophthalmic trunk just at the entrance of the sphenoidal fissure. It passes from the outer side of the orbit beneath the external rectus, diagonally forward and across this cavity to the inner wall beneath the superior oblique, where it enters a small opening in the os planum known as the anterior ethmoidal foramen, and is thus in the ethmoidal labyrinth, supplying this area as well as the frontal sinus by ethmoidal branches. In leaving the territory of the ethmoidal cells it passes upward and again enters the cranial cavity at the outer side of the cribriform plate, running forward to the side and base of the crista galli, where it enters one of the anterior cribriform perforations and passes down into the nasal cavity. Its point of entrance into this cavity is at the extreme anterior-superior angle, dividing here into a septal and an external branch. The septal branch passes downward and forward over the anterior part of the septum, its filaments supplying the anterior portion of the perpendicular plate and quadrangular cartilage. The external branch passes downward in a groove on the underside of the nasal bone, its various filaments supplying the anterior part of the middle and lower turbinal with their neighboring wall and the nasal vestibule. The terminal filaments of this branch leave the interior of the nose between the end of the nasal bone and the superior lateral cartilage, supplying sensation to the ala, tip and bridge of the nose and also the area of the eyebrow and frontal sinus.

The posterior group arises from the spheno-palatine ganglion, and it consists of four sets of nerves. The first is the *naso-palatine nerve,* which arises directly from the ganglion and passes through the spheno-palatine foramen with the other of the posterior group, inward and downward, crossing the anterior surface of the sphenoid sinus just below its ostium and on to the septum; it then passes obliquely downward and forward in a groove on the surface of the vomer just below its upper edge, enters the anterior palatine foramen and then passes through a canal situated in the intermaxillary suture, distributing its terminal filaments to the gum and palate.

The second set are the *superior nasal branches,* which, arising directly from the ganglion, pass through the spheno-palatine foramen into the upper and back part of the nasal cavity. They then pass forward to the mucous membrane of the spheno-ethmoidal fossa, the superior and middle turbinals and a few filaments to the posterior ethmoidal cells and maxillary antrum.

The third set are the *inferior nasal branches,* which are offshoots from the anterior palatine branch of the ganglion. They pass from the palatine canal through openings in the palate bone, and supply the middle and lower meati and lower turbinal.

The fourth set is the *sphenoidal branch,* arising from the vidian shortly after its origin from the ganglion, and supplies sensation to the sphenoid sinus.

In addition to the superior nasal branches the maxillary antrum is supplied by branches from the posterior-dental, which comes from the superior-maxillary root after the formation of the ganglion.

Within the orbit the nasal nerve gives off several small branches, one going to the ciliary ganglion, called the ganglionic, two or three supplying the ciliary muscle and iris, called the long ciliary, and one to the inner angle of the eye and side of the nose, called the infra-trochlear.

The frontal nerve or main branch of the ophthalmic root is known towards its terminus as the supra-orbital, being distributed to the upper eyelid, brow, forehead and parietal region.

The lachrymal branch of the ophthalmic supplies its gland and also the upper eyelid.

These latter nerves are mentioned in order to show the wide field subject to reflex disturbances.

That the branches of these two great nerve roots may represent the hypersensitive area seems to be shown in the relief afforded certain patients after intra-nasal operation and treatment. But in the removal of a spur or the cauterization of a turbinal, or after irrigation of a sinus, only a few of the many nerve filaments within the nose are reached, and that is why the results following many such operations prove of but partial or no benefit. If in addition attention were given to the entrance of the nose, through which many irritating causes find their way, no doubt many more cases would be relieved. Upon this principle is based the value of the small nasal filter, consisting of a piece of fine mesh fabric enclosed in a metal frame and inserted just within the nostrils, thereby filtering the inspired air of almost all irritating matter, although it will not keep out irritating vapors, gases or odors which may be the cause of precipitating an attack as readily as dust or pollen. But the irritating cause may be directed to the external terminal filaments of the nasal nerve which go to the forehead, brow and exterior of the nose, and in order to relieve these filaments of their hypersensibility, something more than filters, cauterization of the turbinals, the removal of ridges and the like becomes necessary. By injecting the nasal nerve at its point of entrance into the nose, we deprive both its internal and external filaments of their hypersensibility. If we are to afford immunity to all cases of this disorder, it will be necessary to inhibit the action of the entire nerve supply of the nose, which means anesthetizing both the anterior and posterior group of nerves. This is easily done by selecting the proper length and curve of hypodermic needle and introducing it into the neighborhood of these nerves as they enter the nose. In the case of the nasal nerve, a needle two and one-half inches long is required, whose point is entered at the anterior-superior angle of the nasal cavity, against the inner surface of the nasal bone, and near its distal end. The posterior group of nerves is reached by a needle three and one-fourth inches long with a curve near its end of 45 degrees. This is entered in the neighborhood of the spheno-palatine foramen, which is located in the spheno-ethmoidal fossa, just above and to the outer side of the posterior end of the middle turbinal. Both nostrils are injected, requiring four injections, two for the anterior and two for the posterior groups. In some cases it may be necessary to inject only the anterior groups. Both dilute and pure alcohol has been used by me for injection, using only a few drops in each injection.

The injections are made painless by a preliminary application of a cocaine solution. No serious ill results have been encountered. I have found that the injections had to be repeated from one to four times, covering the season of attack.

It would appear from a study of the distribution of the fifth nerve that, in a few cases, we still fall short of depriving all of its filaments of their hypersensibility, unless we make our injections central to the off-shoot of the ethmoidal branches. These branches supply the anterior ethmoidal cells, and the frontal sinus, and hence the nasal nerve would have to be reached from within the orbit, just as it enters the ethmoidal foramen. Experiments on the cadaver show this to be an easy procedure by means of a fine hypodermic needle two inches long introduced at the upper angle of the orbit and carefully hugging the bone.

As yet the work carried out by me along these lines has been mainly experimental, and a sufficient number of cases have not been under observation long enough to make this report more than preliminary. But I think with the aid of other workers along this line a most rational mode of treatment may ultimately result from this procedure.

100 State Street.

PHYSIOLOGIC HEARING TESTS.

BY THOMAS M. STEWART, M. D., CINCINNATI, OHIO.

In the course of the writing of this paper, the necessity arose for making a comparative physical examination of several different makes of tuning forks. Three different makes were examined.

The forks usually sold to the aurist are five in number, almost all of them marked as follows:

C of 128 double vibrations per second.
C^1 of 256 double vibrations per second.
C^2 of 512 double vibrations per second.
C^3 of 1024 double vibrations per second.
C^4 of 2048 double vibrations per second.

In different makes these forks vary considerably. Of the two sets examined by me and marked as just indicated, I found,

C of both makes, very close.
C^1 of one make lower than C^1 of the other make.
C^2 of one make higher than C^2 of the other make.
C^3 of one make higher than C^3 of the other make.
C^4 of one make lower than C^4 of the other make.

The third set of forks, Ferguson make, were marked:

50 double vibrations per second.
100 double vibrations per second.
200 double vibrations per second.
500 double vibrations per second.
2000 double vibrations per second.

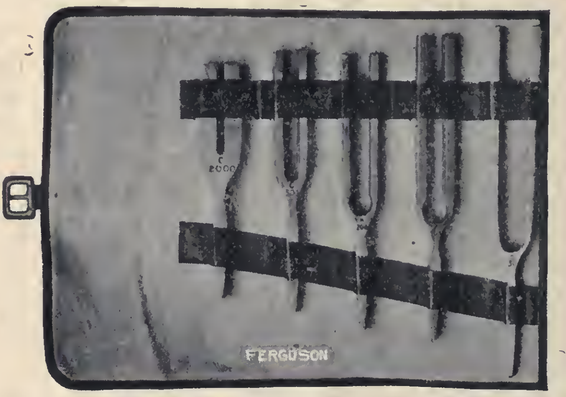
They were tested by the method of sound reinforcement, and the calculations made to determine the number of vibrations per second in relation to their wave lengths and the velocity of sound in the air, at the temperature of the air in the testing tube.

The standardized forks of the University of Cincinnati were used in the examination of the two sets of forks first referred to, and the tests checked by the reinforcement method. But with the Ferguson fork, the standardized fork could not be used, because they were all single vibration and marked in the usual way.

The test with the siren was omitted, because accuracy with it, depends upon long practice to secure the skill necessary to run it at the same speed twice in succession. To obviate this, I am having made parts of an apparatus to carry out the siren principle, so that all the elements of known and controllable speed, constant air current, and sound vibration, may be relied upon.

Sufficient facts were brought out to show that the physical differences in the various tuning forks must be taken into account in their clinical use.

Taking the Ferguson fork of 100 D. V. per second and comparing it with the 128 of the two other makes, a noticeable difference in the relative aerial and bone conduction was apparent. This is due to the Ferguson forks being better balanced, because designed by Dr. Randall of Philadelphia, for ear work, and comparative clinical tests prove that forks modeled on the plan of the chromatic scale, may be improved upon for diagnostic and prognostic aural purposes.



The best assortment of forks for aural purposes may be described as follows:

The tuning fork of about 50 double vibrations per second is valuable in testing *early* obstructive deafness. It is *not* heard aerially by very many whose deafness is beginning; but very audible to many decidedly deaf to high tones through internal ear lesions.

The fork of 100 double vibrations can be heard by almost every one, unless the deafness is *pronounced,* and this too independent of the location and nature of their lesions.

A fork of about 200 vibrations and the one of 500 vibrations will be referred to in the making of the Rinné test, the former for patients over forty and the latter for patients under forty.

For testing the integrity of the internal ear, a fork of 2000 vibrations is better than any lower tone, because if a lesion exists, this fork is more apt to be badly heard or not heard at all.

The Galton whistle, accurately made (Edelmann of Munich makes the best one) will give vibrations from 4000 to 40,000, depending upon the adjustment made. This test enables us to learn the condition of the auditory nerve, by determining the range of high note perception. Beginning with the highest limit of Galton's whistle, the scale is gradually descended until a tone is reached that is perceived by the patient.

These tests can all be made in a comparatively short time, and a brief record can be made of what *is* discovered, so that no barrier need stand in the way of making the tests and the record.

With the proper equipment, the examination can be made in less time than that required for an ordinary case of refraction. The excluding from treatment of those cases in which the examination indicates a bad prognosis will redound to the credit of the aurist, and the satisfaction of knowing what chances the patient may have for more or less favorable results from treatment is worth the effort.

Certain physiological tests can be used to arrive at a differential diagnosis of ear lesions, and at the same time give valuable information on which to base a prognosis in those cases showing deafness and tinnitus aurium.

As the loss of hearing and the annoyance from tinnitus are more pronounced when the lesion is in the middle ear or labyrinth, nothing will be said in this article concerning the more external troubles, foreign bodies, small perforations in the ear drum, etc. It is taken for granted that such lesions, if present, have been duly accounted for.

Experimentally, affections of the drum head, such as perforations, cicatrices and calcareous deposits, cause less deafness than do anchylosis of the chain of bones, or adhesions of the drum to the promontory. The tuning fork tests will show a decided loss of power to hear low tones in obstructive deafness.

By the appearance of the drum head, and the degree of permeability of the Eustachian tube, the state of the mucosa, tympanic and tubal, is determined. The more serious the involvement, the more pronounced the deafness and tinnitus. In slighter degree of inflammation, these symptoms are less pronounced and yield readily to treatment. The ability to hear best in a noise (paracusis Willisii) is a very constant sign of bony anchylosis or sclerotic changes in the mucosa.

WATCH TEST OF FUNCTIONAL POWER OF TENSOR TYMPANI AND STAPEDIUS MUSCLES.

Middle ear inflammation may cause loss of power in the tensor tympani and stapedius muscles, or sclerotic changes and adhesions may interfere with their action. General, systemic or nervous conditions may be a fault to correct, as regards the proper action of these ear muscles. Their function is to regulate the tension of the drum head, and control the intra-labyrinthine fluid pressure, hence their importance to good hearing. They have been likened to the ciliary muscle of the eye, in that they "focus" the sounds in a "mixed" noise and enable us to hear that which we fix the attention upon.

The watch test is made for the purpose of determining their tonicity. One ear of the patient is stopped by a folded towel pressed *around* the auricle, the watch is gradually brought toward the uncovered ear, and the distance recorded after several tests; then the reverse test is made, gradually carrying the watch *away* from the ear and noting the distance to see if he is able to hear it at a greater distance than when approached.

The normal ear will hear the watch further away when approached, but if the tensor tympani and stapedius muscles are weakened it will not be heard at a greater distance as the watch is withdrawn as compared with the first test of gradually approaching the ear with it.

The "focusing" power enables the hearer to select independently certain sounds he wishes to hear. Hence loud ticking watches of noticeably different tones may be used in the effort to have the patient hear either one at will. The normal muscle power will enable the patient to do this; but if these ear muscles are impaired only confusion of noises will be heard.

PROGNOSIS TEST.

Deafness and tinnitus, dependent upon loss of mobility in the chain of bones, call for careful and discriminative examination, not for the purpose of outlining treatment so much as the question of the probability of cure or improvement.

We shall endeavor to systematize this most difficult field of differential diagnosis, because of the fact that some otologists of high attainment, condemn or belittle the physiologic tests of hearing as of doubtful value. Many others depend upon these tests to decide the prognosis, and therefore whether or not the case be taken for treatment.

Jankau, of Zurich, gave an example of indefatigable energy in pursuing the subject of differential diagnosis of the more serious forms of deafness and tinnitus, that the critic of these methods would do well to imitate in the effort to establish the truth, rather than to simply destroy for the sake of some weak points in the presentation of the matter in the inadequate channels of society papers and discussions. Valuable methods in most instances, but not always equal to the personal experience with the tests made systematically, with the aid of the best instruments and for the purpose of prognosis.

TUNING FORK PRINCIPLES.

(a) The normal ear hears the tuning fork about twice as long by air conduction as compared with bone conduction. But age reduces bone conduction, perceptibly so, after the fiftieth year.

(b) Loss of mobility or any lesion of the conducting apparatus increases the intensity and duration of bone conduction; and hearing for low tones is diminished, or it may be lost.

(c) Disturbances in the perceptive apparatus, decreases the duration and intensity of hearing by bone conduction; and hearing for high tones is diminished or lost.

To explain the "why" of these phenomena has led to the advancement of many ingenious theories, the discussion of which often clouds the practical value of the tests as we use and know them.

TUNING FORK PROCEDURE.

Air conduction is first tested, the fork being thrown into vibration by falling through the arc described by placing the handle on the thigh and allowing the fork to strike by its own weight (occlude the ear not under test). For patients under forty a C^2 or 512 vibration fork is best. Those over forty use the C^1 or 256 vibration, i. e., middle C of music. The duration of hearing is noted, then without again striking it, note if any vibration is heard by bone conduction, but occlude the ear under test for bone conduction. The Weber test may then follow, occluding both ears by towels held against the auricles, because in this way the patient is enabled to detect hearing power in the affected ear, a thing he might *not believe* if the tests are reversed.

Politzer's test with tuning fork vibrating before the nostrils should disclose greater hearing power at the instant of swallowing, if the Eustachian tubes are patulous and no labyrinthine involvement is present. It is well to re-test aerial and bone conduction after inflation in any doubtful case.

It is well then, to test the duration of aerial and the duration of bone conduction separately with a fork that a healthy ear can hear for at least fifteen seconds. Because to *establish the fact* of an unhealthy internal ear by diminished bone conduction, or a healthy internal ear by increased bone conduction, is a distinct aid in the further examination and prognosis of the case. *All* the fine points need not be elaborated here, but increased bone conduction excludes the existence of deafness due to obstruction in canal. Eustachian tube, etc. The latter may be present in conjunction with disease of the internal ear, constituting a "mixed" deafness.

The watch test for reasons already given, and the duration in seconds of bone conduction, thus furnish diagnostic valuable aid, prior to direct observation; but the use of tuning forks of various vibrations have an added value in *prognosis.*

605 Traction Building.

A Foreign Body in the Larynx. E. BERGH. *Monatsschrift fur Ohrenheilkunde,* Oct. 1905.

An elderly man who for years had worn a hard rubber plate to cover a perforation in the hard palate resulting from an old tertiary lesion, stated that he had swallowed the plate and shortly thereafter had become hoarse. He had no pain or difficulty in swallowing. The author found a large ulcer on the left side of the larynx, with sharply cut, undermined edges, a smooth greyish base, extending over the entire side of the larynx. He regarded it as a tertiary lesion. After a few days what appeared to be a piece of cartilage was found to project from one side of the ulcer. Upon seizing this with forceps, he extracted the hard rubber plate, the surface of which was encrusted with lime, salts and dried mucus.

YANKAUER.

THE CLIMATE OF COLORADO ETIOLOGICALLY AND THERAPEUTICALLY CONSIDERED.*

BY JAMES ALLEN PATTERSON, M. D., COLORADO SPRINGS, COLO.

The consideration of the various influences of the climate of Colorado upon the catarrhal condition of the upper air tract cannot be considered rationally without first briefly alluding to its varied physical geography. A state with an area of 103,925 square miles with watersheds running in diverse directions, altitudes varying from 4,000 feet to forty mountain peaks over 14,000 feet and fifty over 13,000 feet, naturally presents different characteristics.

What we term the western slope from the great continental divide in the neighborhood of Leadville at 10,500 feet to the Utah state line where the elevation lessens to 4,500 feet, presents a climate characterized by much snow in winter and in summer, heat distinctly above temperate. In this belt, in the valleys, sugar beet growing and fruit raising are carried on to great profit. On the eastern side of this slope when the higher mountain ranges are left behind, the climate is characterized by winters less severe with less snow and less rainfall and by summer nights too cool to foster the agricultural pursuits of the region just mentioned. Then as we go farther east or north and get away from the mountain influences, greater warmth in summer is encountered fostering, where water is available for irrigation purposes, productive agricultural pursuits.

The climate which is usually had in view when that of this state is mentioned in connection with the cure of tuberculosis, is that of this eastern slope in the foot-hills of the Rocky Mountains not far enough away to get the heat in summer, the cold in winter nor the atmospheric moisture of the states which border it on the east.

In tubercular affections, I am impressed first by the importance of the climatic influence upon the laryngeal manifestation. I shall never forget the fear in attempting the control and betterment of laryngeal tuberculosis engendered by experiences on the eastern seaboard that assailed me in beginning work in this line in Colorado, but I will remember the surprise that awaited me as a result of my efforts. I began seeing cases that I should have considered utterly hopeless, improving under methods that were futile elsewhere. I recall a case that presented the typical pyriform-shaped swelling of the arytenoids, hoarseness and much cough, go out of my observation for four of five weeks to sojourn upon a ranch in mid-winter where the food was supposed to be poor as well as plain, where one could live in only comparative comfort, where fortunately there was nothing to do but sit along the "sunny side of the barn," eat when food was served and sleep when the sun set. This person returned at the end of the period mentioned with arytenoid cartilages of normal contour, only some catarrhal laryngitis remaining. He is practicing his profession to-day—some eight years since. Yet I do not want you to deduce that our climate has an effect upon the larynx only; there may be a few exceptions to the rule, that laryngeal tuberculosis improves in more or less ratio to the general improvement of the patient's condition. When the patient is able to support the tubercular invasion which is aided by climate and hygiene, our well accepted methods of dealing with tuberculosis of the larynx are surely much enhanced.

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*Read before the American Laryngological, Rhinological and Otological Society, Pittsburgh, Pa., May 28-30, 1908.

Tubercular diseases of the middle ear as evidenced by breaking down of the drum membrane with little inflammatory or sensory symptoms are more apt to become quiescent, less liable to dangerous outbursts than elsewhere; and upon the improvement of the patient's general health or stay of his disease, the ears usually become free from discharge. Tuberculosis of the pharynx and mouth are so surely manfestations of the last stage of the disease that they are mentioned only to indicate the bad prognosis.

The influence of the dry air of Colorado upon catarrhal condition of the upper air passages is more difficult to summarize than its influence upon tubercular conditions.

Hypertrophic nasal catarrhs with more or less nasal stenosis are distinctly benefited. Where there is abundant secretion it is usually lessened so quickly on one's advent that a preliminary dryness as pointed out by the late Dr. Solly, with probably a little blood stain when the nose is blown, is frequently met with and leads the patient to very erroneous conclusions regarding his affection, in fact a great deal of the mild nose-bleed which the laity attribute to high altitudes is simply due to inspissated mucus within the nasal vestibule that is picked off roughly until the mucous membrane is abraded and bleeds under a very slight irritation such as the blowing of the nose.

Those who suffer from true hay fever in other and damper climates are frequently absolutely relieved. I can attest personally to my own perfect cure of it since residing in Colorado Springs. Paradoxically there are found old residents who have developed hay fever in Colorado who do not have it in damp climates.

Atrophic rhinitis and its sometime accompaniment atrophic pharyngitis being dependent upon diverse causes is susceptible of so many classifications that I approach the subject with diffidence. I shall exclude ozaena. I commonly meet it as a very mild form of rhinitis sicca with sensations of annoyance far out of proportion to the variation from normal appearances. I have never seen this form progress unfavorably, though it is very rebellious to treatment except where it has been caused by irregularities of the septum, turbinal occlusions, or enlarged tonsils; in the latter cases great relief is obtained by operative procedures. These rebellious cases are usually found in lithaemic individuals and seem to be aggravated by the rapid evaporation of moisture in the anterior third of the nostril, which takes place in dry atmosphere. Such cases are distinctly more comfortable in moist climates.

Perforations of the septal cartilage, particularly where there is a deflection with occlusion, are more apt to occur than in damp regions; also septal deviations, encroaching upon the vestibule, are usually more apt to give annoyance than they do in moist zones.

Catarrhs of the Eustachian orifice, when due to hypertrophic rhinitis, are benefited; but since most of such cases are complicated with deflected septae, enlarged tonsils or even adenoids, operative measures are imperative.

I have been unable to formulate any rule to apply to the cases of chronic middle ear catarrh; I meet cases where the presence of tenacious mucus in the tube is most obstinate even where there is little abnormality of shape or where there is very little alteration in the secretion as evidenced by the appearance of the nose and nose pharynx. Many of these cases are benefited when coming from moist climes. My observation of the effect of treatment upon such conditions originating in Colorado shows about the same degree of stubbornness everywhere encountered. I feel, however, that such cases developing in moist climes are benefited. Some of those developing in Colorado may be improved elsewhere, yet most of the cases that I have sent away have returned showing no benefit.

Cases are seen of chronic suppurative otitis media that come to Colorado, of their own accord, yearly, because they find the discharge lessens and their general condition is greatly improved by doing so.

My experience has been when operative measures are undertaken upon such cases that post-operative healing is unusually rapid. The deduction is therefore obvious. This is simply in accord with a statement made by Solly in 1903 that "with regard to surgical cases treated at an altitude, nasal or otherwise, it is undoubtedly true that they do better and require less post-operative care than at a low level."

805 North Tejon Street.

Disturbances of Taste in Chronic Middle Ear Suppuration.

LUDWIG KANDER. *Archiv fur Ohrenheilkunde*, May 1906.

After a critical review of the subject and a report of a number of illustrative cases, the author arrives at the following conclusions: The chorda tympani is the nerve of taste for the anterior two-thirds of the tongue, the tympanic plexus for the posterior third. Complete destruction of these nerves results in a complete loss of the sense of taste, partial destruction, in diminished or delayed sensibility, absence of after-taste, or complete loss of sensation in localized areas. Although the chorda tympani is frequently destroyed in extensive suppuration, especially when associated with cholesteatoma formation, it may remain intact even when the suppuration is severe. The tympanic plexus may be likewise affected. During ossiculectomy or the radical operation, the chorda tympani is regularly destroyed, the tympanic plexus occasionally. Disturbances of taste after these operations are permanent, subjective sensations which occasionally are observed being due to irritation of the central stump of the nerve. The plexus and the chorda do not contain tactile fibres, but loss of tactile sensation in the tongue may be secondary to the loss of the sense of taste. The electric current does not cause a sensation of taste except in those areas in which other substances cause such sensation. YANKAUER.

THE CLIMATE OF THE NORTH AND NORTHWEST IN ITS ETIOLOGIC AND THERAPEUTIC RELATION TO DISEASES OF THE NOSE, THROAT AND EAR.*

BY CHARLES NELSON SPRATT, B. S., MINNEAPOLIS, MINN.

"The climate of a region or site is the combined effect of the atmosphere and of the nature of the surface, in their relation to man." The weather is merely a phase of the climate, changeable from day to day.

The atmosphere varies in chemical composition, in temperature, in pressure, humidity, diathermancy, transparency, dust, electrical conditions, and in the force and direction of the winds. Other factors are latitude, altitude, relations to large bodies of water, deserts, etc., nature of the soil, surface, i. e. slopes, plains, valleys, etc., cultivation of the soil, drainage, manufactories and density of population.

The untutored savage has always looked upon the natural phenomena with awe and reverence. It is not strange that to-day, certain individuals hold the climate responsible for their aches and pains. They likewise think of some climate, other than their own, generally those described by railroad circulars, as the panacea for all their troubles.

As knowledge replaces theories, the direct influence of climate in the etiology and treatment of disease, becomes less prominent.

Twenty years ago malaria was considered to be a direct result of climate. A certain "miasma" arising from swamps was thought to be the cause of the disease. We now know that malaria is due to a protozoon transmitted to man by the mosquito. Until recent years yellow fever and the "sleeping sickness" were considered to be in some way caused by the tropical climate. Reed, Lazear and Carroll demonstrated beyond doubt, that the infection of yellow fever is likewise transmitted to man by the mosquito. Koch has recently shown that the sleeping sickness of Africa belongs in the same group. The hot climate offers conditions favorable for the existence and spread of these diseases. Typhoid fever, influenza, pneumonia and many other diseases formerly considered to be due to climate, are now known to be caused by bacteria.

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*Read before the American Laryngological, Rhinological and Otological Society, Pittsburgh, Pa., May 28-30, 1908.

Although man can exist in any climate, hot or cold, moist or dry, high or low, where food is sufficient to support life, or the natural enemies are not too numerous, his physical, mental and moral make-up are influenced by the external conditions.

Experimental work on animals has shown that chilling, either by ether spray, or dipping into ice water, is generally followed by cloudy swelling, and granular degeneration of the hepatic and renal cells, with fever and albuminaria. While these experiments are not applicable to man, they show that excessive changes in temperature will cause, at least in animals, pathologic conditions. Lode found that animals chilled by wetting the fur more readily succumbed to infections. This may explain why pneumonia, rhinitis, and other acute inflammations of the respiratory tract, that so frequently follow a chilling of the body, are due to infection following a lowering of the resistance.

The climate of the north and northwestern part of the United States, east of the Rocky Mountains, would be classed, according to Koppen, as a cool temperate climate, i. e. monthly averages above 68° F. are limited to the summer months.

In such a vast territory, extending nearly 2000 miles from east to west, and 500 miles from north to south, with the same general climate there are many variations. In a paper limited as to time. it will be impossible to speak more than in general terms of these minor differences in climate. The climate of a certain locality is often quite different from regions only a few miles distant. A southern exposure is generally warmer and more protected from the winds than a northern, valleys are generally damp, the air of the hills and mountains is dry.

The winters of Minnesota and Northern Maine are long and rigorous, the summers short and often sultry. The winters in regions 400 miles south are mild, the summers long and semi-tropical.

The mountain ranges along the Atlantic coast offer a cooler and drier climate than regions near the ocean.

The amount of sunshine, in different portions of the North, varies considerably. In the winter of 1901 at Buffalo, New York, there were 56 cloudy, 34 partly cloudy and no clear days, while at Atlantic City there were 22 cloudy, 32 partly cloudy and 26 clear days. In general, along the Atlantic coast, the sunshine increases as we go south and the fog becomes less.

The prevailing winds are from the Northwest and South. The former are dry, the moisture having been precipitated on the western slope of the Cascade Mountains. The moist south winds, a part of the trade winds, travel from the Gulf up the Mississippi Valley. The New England coast in the winter time is often swept by cold damp gales from the North and Northeast. Fogs so frequent along the Atlantic coast are rare in the Northwest.

The so-called dry steady winters of the Northwest show as great a daily range of temperature as in the East, but it is less noticeable to the individual. A drop of 20° in temperature, from 50° to 30° F., is more noticeable than an equal change of temperature from 20° to zero.

The humidity varies considerably, being greater near large bodies of water. The climate of the Northwest has for a long time enjoyed the reputation of being dry. This, according to weather reports, is more apparent than real. Owing to the lower temperature, the absolute humidity of the Northwest is less than the Eastern States. The mean relative humidity is about the same as that of the middle Atlantic coast. Below 55° F. the evaporation of cutaneous moisture is so slight that the humidity is not noticeable.

With the exception of the mountains along the eastern coast, the elevation is for the most part under 1000 feet.

It is undoubtedly true that a large percentage of the inhabitants of the northern part of the United States are sufferers from what are commonly grouped under the indefinite but comprehensive term "catarrh." It is well known that acute inflammation of the respiratory tract, the "colds," the "coughs" and the "sore throats" are not as frequent in the summer months as during the rest of the year. Nasal stenosis and excessive secretion are more common in cold weather.

This is due to the extra work thrown on the nose in warming and moistening the cold, dry air. Inturgescence of the turbinates occurs if the nose is narrow or deviations or spurs exist; stenosis results and this is followed by an increase in the amount of nasal discharge.

It is also true that individuals with adenoids, hypertrophied turbinates, chronic pharyngitis and laryngitis, are worse during the winter months. That these diseases of the respiratory tract are not due to cold *per se* seems probable from the fact, that the original inhabitants and early settlers were relatively immune.

A cold climate is bracing and adapted for the maintenance of vigorous health. The activity of the individual is greater, more CO_2 is said to be given off by the lungs and muscular power is increased. With moderate changes in temperature the individual's resistance is increased.

In considering the effects produced by climate, in its relation to disease, we must take into consideration a far more important factor,— the artificial climate. In the northern part of the United States, the individual lives for nearly eight months under the unnatural conditions of this artificial climate. In the East and Central States, five or six months are spent in the natural climate, the remainder in the artificial.

This artificial climate is an outgrowth of our modern civilization. By this I do not refer to the changes produced by the drainage of swamps, the felling of forests, etc., but to certain far more important changes; of these may be mentioned:

First, Crowding.—According to the United States census of 1900, 31.3 per cent. of the total population lived in cities of 8,000 or more. This herding together increases the spread of infection, especially diseases of the respiratory tract. As a rule the denser the population the more unsanitary are the conditions.

Second, Dust.—In the city the pure air of the forest and prairie is replaced by a smoky, filthy, dust laden atmosphere. Dried sputum and excrement from many horses, pulverized by the constant traffic, thrown into the air by street cars and automobiles, is blown into our eyes and nostrils. No window casing is tight enough to keep it out of our buildings. The constant breathing of such dust laden air, even if the bacteria have been killed by the action of the sunlight, must have an irritating effect on the respiratory mucous membrane.

Pneumonia, influenza, and tuberculosis are in many cases dust infections. Could the infection be traced, doubtless acute rhinitis, tonsilitis, conjunctivitis, might be included in the above. Polishers, stone-cutters and grinders, are frequently sacrificed to their occupations, by the constant inhalation of sterile dust.

Health officers say that after a few bright, warm, dry, dusty days, the number of cases of infectious diseases is sure to be increased. The severe influenza epidemic of 1889 followed a mild, open winter and autumn. The same is true of the past winter in the Northwest. There is much truth in "A green Christmas means a fat graveyard."

Third, Overheated buildings.—As has been stated, during six to eight months of the entire year, a large percentage of the population live in a semi-tropical climate. Houses and offices are heated by steam, hot air, etc., until the temperature is 70° F. or over. The humidity in most cases ranges from 5 per cent. to 10 per cent., when it should be 50 per cent. to 70 per cent. In zero weather to give a relative humidity of 65 per cent. would require in the average house with a temperature of 70° F. the evaporation of six gallons of water.

Fourth, Sudden and marked changes in temperature and humidity.—In the natural climate a fall of 20° in temperature as from 70° to 50° F. is very noticeable, an equal fall from 20° F. to zero is not so apparent. Although in the Northwest the changes in temperature are just as marked as along the Atlantic coast, the changes in the winter are not so noticeable on account of the low average thermometer. In the winter months the changes from the hot, dry air of our buildings to that of out-of-doors may range from 30° to 100°. F. The suddenness of this change is not to be compared to that of any natural climate. The effect of this change on the respiratory tract, is far more serious and likely to cause irritation than cold.

Fifth, Deficiency of Sunlight.—This is due not only to the thick pall of smoke covering most of our cities, but to the indoor life led by a large proportion of our population. The bactericidal action of light is an important factor in preventing the spread of disease.

Pneumonia, influenza, acute sinusitis, diphtheria, acute otitis media, tonsilitis and probably acute laryngitis, rhinitis and pharygitis, are due to bacterial infection. Sudden changes in temperature, dust, and mouth breathing, lessen the resistance and make infection possible.

Repeated attacks of acute inflammation, especially when the individuals live under unnatural conditions, lead to permanent changes in the tissues. We thus have hypertrophy of the turbinates, adenoids, enlarged tonsils, chronic sinusitis, polypi, and chronic inflammation of the larynx and pharynx. A large percentage of chronic catarrhal otitis media cases are secondary to diseased conditions of the nose and naso-pharynx. The tinnitus accompanying such conditions is in some cases undoubtedly influenced by the atmospheric changes. These cases frequently improve in hearing and the tinnitus ceases after free nasal respiration has been established by operation. Practically all cases of hypertrophy of the turbinates, adenoids and enlarged tonsils, cases with dry and the secretory form of catarrh of the middle ear are better during the summer months. The cold or rather the sudden changes from hot dry houses to the cold winter and autumn air aggravate the conditions. Patients who go south for the winter find relief.

True hay fever or rose cold, occurring in May and June, is not common in the United States. Our so-called hay fever occurs in the late summer and autumn. There can be but little doubt that in a large percentage of cases the pollen-toxin of the rag-weed or Ambrosia is the exciting factor. Britton and Brown, give the distribution of the genus Ambrosia as follows: From Nova Scotia to Florida west to British Columbia.

In the North the plants are poorly developed and the amount of toxin is less than in those growing farther south. The plants bloom about the twentieth of August in the region about New York City. Sufferers find relief in the mountains and the north shores of the Great Lakes. The disease is rare in the region of Lake Superior.

Tuberculosis of the larynx is a disease practically always secondary to pulmonary tuberculosis. Cures of the latter condition are obtained in almost any climate. A moderately cool, dry climate with much sunshine has a more stimulating effect than a warm climate. Climate plays no role in the etiology of tuberculosis of the larynx. In regard to the treatment, the general resistance must be increased and a mild climate with a dust free air is to be desired.

Acute diseases of the upper air passages are not subject to climatotherapy except as to prophylaxis. The chronic diseases of the upper respiratory tract, as adenoids, hypertrophic rhinitis, inturgescence, etc., cause less disturbance in a mild warm climate, not subject to sudden change.

The climate of the North, while both directly and indirectly being of much importance in the etiology of disease, has but little value in the treatment.

Conclusions—

First. The influence of climate in the etiology and treatment of disease has been over-estimated.

Second. Acute and chronic inflammation of the respiratory tracts are more frequent and worse during the winter months.

Third. These conditions are not due to cold but to certain artificial conditions under which the individual lives from six to eight months,—the artificial climate. This includes crowding, dust, over heated rooms with dry air, sudden changes from heated rooms to the cold outside air and deficiency of sunlight.

Fourth. Diseases of the ear, nose and throat are common in the North, due to the above conditions.

310 Syndicate Arcade

A Case of Primary Bilateral Mastoiditis. P. G. GOLDSMITH, M.D. *Montreal Med. Journal*, Oct. 1907.

Following Grippe, pain in vertex and along posterior auricular with tenderness of posterior cartilaginous walls of both ears were noted. Hearing and membranes normal. Swelling of walls of external auditory canal quickly ensued with mastoid tenderness. Both mastoids were opened, existing disease with pus containing pneumococci was found. WISHART.

Motor Paralysis of the Superior Laryngeal Nerve. E. KRONENBERG. *Monatsschritt fur Ohrenheilkunde*, Oct. 1905.

In this interesting and unusual case the paralysis of the motor branch of the superior laryngeal nerve was caused by the pressure of a tumor upon the side of the thyroid cartilage. There was no sensory disturbance in the larynx, no paralysis of the epiglottis. The voice was peculiarly deep and creaky; high notes could not be produced. The vocal cords were slightly reddened, the paralysed cord being situated lower down in the larynx than the normal cord. Occasionally the paralysed cord was shorter and bowed outwards, but this condition was not constant. The author believes this was due to a temporary paresis of the thyro-arytenoideus internus. The case was not under observation long enough to determine the effect of the removal of the tumor upon the paralysis.

YANKAUER.

THE HEADACHE OF NON-SUPPURATIVE FRONTAL SINUITIS.*

BY FRANK BRAWLEY, M. D., CHICAGO.

I wish to present the history of a very interesting case illustrating the headache of non-suppurative frontal sinuitis. This condition I consider to be a distinct clinical entity, which is as susceptible of accurate identification as any microscopical specimen can possibly be. My first reports upon this condition were made before the Chicago Ophthalmological Society, and the Ophthalmic Section of the American Medical Association, as these cases most frequently consult the ophthalmologist because of the marked eye symptoms which are always present.

The literature presents only two cases which seem to belong to this particular class. Robertson reports one case briefly in the *Journal of the American Medical Association* of March 5th, 1904, and Ewing and Sluder also report a similar case in the Transactions American Ophthalmological Society, May, 1900.

We find the region of the middle turbinate body usually normal in appearance, although one looking for a possible nasal origin of an intractable headache would note the close approximation of the middle turbinal to the lateral nasal wall. This condition causes a blocking of the fronto-nasal duct upon slight turgescence of the turbinal, so that we get a history of unilateral pain coming on in damp, chilly weather, with colds at the menstrual period, etc.; in short, whenever nasal congestion occurs.

With the duct blocked no air can enter to replace the oxygen, which is rapidly absorbed in the lining sinus membrane. A vacuum results with consequent swelling of this lining membrane and irritation of the fibers of the anterior nasal nerve producing a headache in the region of the distribution of this nerve, namely, the orbit, frontal sinus and anterior portion of the nose.

If the patient is seen during a headache he may usually be relieved by applying suprarenalin 1-1000 or cocain two per cent. to four per cent. under the tip of the corresponding middle turbinal, thus restoring the free interchange of air between the nose and frontal sinus. This is proof positive that the obstruction was the cause of the headache and the anterior third of the turbinal may be resected, usually with permanent relief. In the event that the patient cannot conveniently be seen during an attack, the headache may be artificially produced by means of the suction pump which I have adapted for the diagnosis and treatment of suppurative nasal accessory sinus disease.

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*Read before the meeting of the Chicago Laryngological and Otological Society, April 14, 1908.

The history is as follows: August 16, 1907, Mrs. R. D. consulted Dr. Casey Wood on account of persistent headaches about the right eye. She had been repeatedly examined in a general way with negative findings and had been referred to Dr. Wood by Dr. Peterson of Ann Arbor, after he had failed to find any pelvic trouble. As a child she suffered from photophobia. No lid or extra-ocular muscle symptoms. The chief symptoms began ten years ago, and have been present in attacks two to four times a month and invariably at her menstrual period.

The pain usually begins at 4 a. m. and is located in the left eyeball. By 7 a. m. nausea begins, followed by vomiting which continues for one or two days, usually ceasing at sundown of the second day. During the attack the left eye is bloodshot and pain is increased by movement of the head. The attacks at the menstrual period are always the most severe, those occurring in the intervals being much milder.

Glasses had been worn without relief. I found under atropia one diopter of hypermetropic astigmatism, axis 145 which was ordered. A headache of the typical form was produced by the suction pump used for ten minutes and was very severe during the following night. It was relieved next morning by the cocain and suprarenalin application under the middle turbinal. I then resected the tip of the middle turbinal and patient went to her home in northern Michigan before complete healing had taken place.

The attacks were much less frequent and severe for a month or two and then became as bad as ever, in spite of the attempts of her physician to probe the frontal nasal duct. She reported to me on March 10, 1908. The lower end of the fronto-nasal duct was partially occluded with thickened mucous membrane and the sinus could not be entered with a probe. The duct was cauterized as far as possible with trichlor-acetic acid. This was repeated on the next day. On the third day I was able to pass the probe into the frontal sinus and I then cauterized the entire duct with a bead of chromic acid fused on a probe bent to the proper curve to enter the sinus. I followed this by passing the probe daily and by gentle curettage with a bent applicator thinly wrapped with cotton. During this time the menstrual flow appeared and passed away without a symptom of the old severe headache for the first time in ten years. Forty minutes' suction treatment did not produce any pain, whereas the first trial had produced a most severe attack after ten minutes' use These tests would seem to prove conclusively that the condition has been satisfactorily dealt with, but the test of time of course remains.

72 East Madison Street.

Primary Melanosis of the Palate: Naso-Buccal Fistula of Recent Sarcomatous Origin. J. N. Roy, M. D. *Medical Record*, Nov. 2, 1902.

The physiology of animals is capricious, but with man melanosis of the palate has always a serious signification; either it is a percursory symptom of future disease, or it is a complication of an already existing tumor, or else it begins with the new growth.

A very complete history (with plates) extending over ten years, with a possible connection with an injury to the palate from a clay pipe occuring ten years earlier. Wishart.

An Attempt to Treat Tuberculous Affections of the Pharynx and of the Larynx by Trichloracetic Acid. Dr. Okouneff. *Arch. intern. de laryngol.*, March-April, 1905, No. 2.

The author has obtained excellent results by this method for which he claims the following advantage:

The formation of a whitish slough following the cauterization shows exactly how far the liquid has been applied; that slough remains adherent for two or three days and prevents infection from the sputum.

The author has never had complications from this treatment. The application should extend as far as the healthy tissues.

Scheppegrell.

THE TECHNIQUE OF ADENOIDECTOMY AND A PERFECTED CURETTE.*

BY F. GURNEY STUBBS, M. D., CHICAGO.

There is no apology needed for bringing before a body of such distinguished laryngologists as this, a paper on this subject, for the last word has not been said regarding either the anatomical consideration of lymphoid tissue in the naso-pharynx, or the technique of its removal; and the latter depends absolutely upon the former.

In the first place, we have to deal with a part of what is called "Waldeyer's ring;" that is, encircling the entrance to the pharynx we find in or under the mucosa, more or less continuously, lymphoid tissue, which in four points is massed, giving us the four tonsils, lingual, pharyngeal and faucial. These are found in all cases, in adults as well as in children, though in some they are so small as to seem, at first glance, to be absent. Occasionally we see cases where the whole ring seems to be enlarged, so that there is no line separating the lower pole of the faucial tonsil and it seems to continue well down towards the larynx and over onto the tongue; numerous follicles show on the lateral pharyngeal walls posterior to the posterior pillar of the tonsil; and where a view can be obtained, the lateral recesses of the naso-pharynx (Fossa of Rosenmueller) are also seen to be thickened. But this rather rare condition does not for a minute lead one to regard the faucial tonsil as any the less a circumscribed body nor do we attempt to go beyond this tonsillar body in its removal.

In like manner we must regard the pharyngeal tonsil. There is always a central mass, larger and thicker, no matter how much increase there may be in lymphoid tissue laterally. While the pharyngeal tonsil differs little in structure from the faucial, yet the pathological changes may be divided into four varieties—the soft, diffuse, composed largely of lymphoid structure, the oedematous or cyanotic; and the hard or hypoplastic, due to an increase of lymphoid structure and a decided overgrowth in the connective tissue element.

In all cases the adenoid is lobulated, the lobes lying close together so as to have their adjoining sides flat and the lateral ones shorter and not so deep, so that on its removal it has a rather circular outline.

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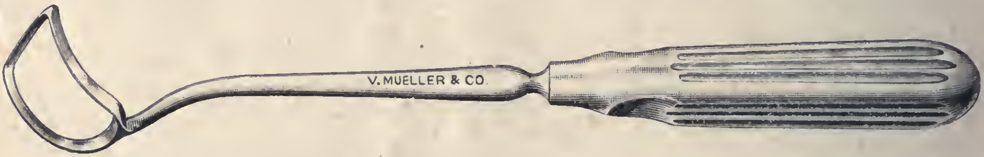
*Read before the regular meeting of the Chicago Laryngological and Otological Society, March 11, 1908.

I have often found cheesy masses of epithelial debris similar to those found in tonsillar crypts, which had been retained by the superficial edges of these lobes becoming adherent and forming a sort of pocket.

The next step is to study the anatomical seat of the adenoid. This is on the vault of the pharynx. I use the word vault advisedly, for two reasons. First, the adenoid proper does not extend into the Fossa of Rosenmueller. If that space, which is the lateral angle of the union of vault and lateral wall of the pharynx is any way encroached upon, it is only due to an increase of the lymphoid tissue normally there and is not the adenoid proper. Secondly, the same condition is present where there is any thickening on the posterior wall below the adenoid. The adenoid is attached only by its posterior edge to the posterior wall. Its base is entirely on the vault. By the term vault I mean that part of the pharynx which is nearly horizontal, beginning anteriorly at the junction of the vomer and sphenoid, extending posteriorly to where it curves downward to the perpendicular, on the anterior surface of the atlas and axis, It is the basilar process of the sphenoid and occiput and is fairly level. The lateral walls of the pharynx meet the vault at a right angle. Hence we have a well defined body attached to a fairly level or sloping surface and it only needs a proper knife to slice it off.



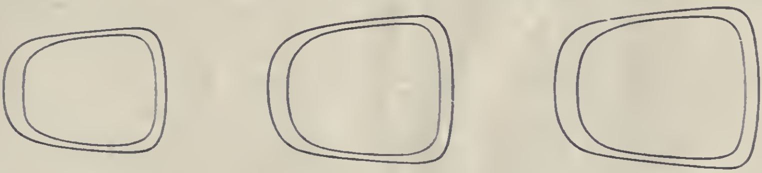
This is met by the so-called Adenoid Curette. But not by any and every curette one will find in the shop. By a study of the skeleton, cadaver and live subject, I find that the shape of the curette is absolutely essential to a thorough removal. Further, it must be used correctly. With a *correct intrument* and a *correct technique the adenoid should be removed entire with only one sweep of the knife.*

I have altered the well-known von Beckmann curette as to the angle, depth and curve of knife, width of side, or supporting pieces and their position as to recession from edge of knife. By its correct use it does not curette or scrape, but slices the adenoid smoothly from its basal attachment, with the individual lobes entire and included with their base.

It is necessary to use an instrument as wide as will snugly fit into the vault and reaching from one lateral recess to the other. To meet this I have chosen three sizes which will suit all ages, the inner cutting edges being respectively, thirteen, sixteen and nineteen millimeters across.

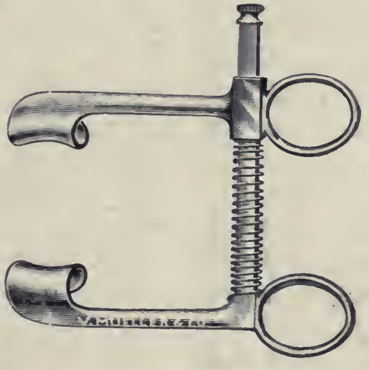
If the patient is in the erect position, with or without an anesthetic, or in prone position under general anesthetic, the procedure is the same.

The mouth is opened to the fullest extent, and for this I have modified the Murdock self-retaining mouth-gag. This is actually self-retaining and is not in the way, allows the patient to be turned from side to side without removal, and can be quickly removed by the finger rings I have added as easily as one would wish.



A tongue depressor is of assistance in allowing a free view, to see that the curette is passed between the posterior pillars and up back of the uvula, and then withdrawn.

As soon as the back of the knife is raised above the uvula it is drawn forward to the vomer and hugging its posterior edge is pushed as tight to the vault as possible. It is then forced directly backward in a horizontal plane till it reaches the posterior wall when the handle is sharply elevated and the knife cuts into the angle which is there present. Elevating the handle still more causes the knife to cut one to one and a half centimeters down the posterior wall at which point the lower limit of the adenoid is reached.



Then a quick withdrawal of the curette will sever the adenoid from its attachment at its lower periphery and in many cases precipitate it onto the floor. If this does not occur it will lie on the lateral wall of the pharynx, if the patient is on his side (the correct position), and can be withdrawn by fingers or forceps. No hood to catch the adenoid can be attached to a curette without impairing its usefulness. The danger of obstructing the larynx by the detached adenoid is mostly theoretical anyway.

To explain the reason of this detail: *First,* the back of the knife must hug the back of the vomer all the way up in order not to force any lobes or parts of lobes into the posterior choanae and thus interfere with the knife being properly applied entirely in front of the adenoid. This cannot be done where the knife is first applied to the posterior wall of the pharynx and then forced up over the adenoid, which procedure explains why so often after its use a fringe of adenoid remains at the posterior choanae and the symptoms of obstruction are not relieved.

Secondly, the direction of the stroke of the knife must first be directly backwards and only after it meets the posterior wall should it be made to cut downwards. My observations have been that too many operators depress the knife with the beginning of the stroke and then return and make the same mistake for seven or eight strokes more and have only a few pieces and much blood to show for all the misdirected scratching.

Thirdly, the downward stroke on the posterior wall should only be for one to one and a half centimeters and then a quick pull or jerk forward to free it and if possible throw it entirely out of the mouth. There is no excuse for stripping the posterior wall as is so frequently done. This is caused by scraping below where the adenoid is attached and by the wrong angle of the knife. I have set the knife at such an angle that it cuts horizontally on the vault and will not scrape down the back wall if drawn sharply forwards as soon as the adenoid is separated above. It is also straighter on its upper cutting edges and its supports recede so that it can approach the posterior wall flush to its union with the vault and thus not leave a mass of adenoid tissue in the angle. If one will compare many instruments found on sale it will be seen that the knife edge cannot cut at all on the vault but only with a downward motion on the posterior wall. This instrument is narrow so as to allow its being raised anteriorly to the adenoid and thus leaves none where it is most essential to be removed.

Lastly, while more delicately formed it is hand forged and thus can be relied upon not to break. And it should be kept sharp for it is not a scraper but a knife.

I believe too much importance cannot be attached to the details I have brought out, both in instrument and technique, if we are to completely remove adenoids as they should be. One can readily see from a study of the adenoids I present that they are complete in their entirety and I have proven them so by both digital examination and rhinoscopy where possible. By the study of same one also sees that adenoid forceps only tears away fragments and leaves a ragged, uneven surface, cannot get down to the absolute base, and cannot reach into the lateral recesses as well as a properly fitting curette. In an infant one cannot even manipulate a forceps. I have found no trouble at all in using curette No. 1 in an infant six months old. In such a case very little force is required for the adenoid is soft, but it will be found just as complete as in older patients.

There are two chief indications for the removal of adenoids; first, where they act as an obstruction to nasal respiration by blocking the posterior choanae, or where they encroach on the Eustachian eminences; second, where by their formation of pockets they act as an antrim of infection similar to the tonsil.

These indications can be absolutely met by this curette in their removal. It is true it will not cut laterally and dig into the Fossa of Rosenmueller, but it is not necessary in meeting the ordinary indications. That would be attempted only in the special cases where the lymphoid (I do not use the word adenoid) tissue is in such increased amount that the aurist sees the special need for its removal. Then it would be accomplished by special curettes as the lateral ones of Fein, Mygind and others. This rather rare procedure I would disregard in all but special cases.

A study of the exudative diathesis of Czerny would show us that removal of more than the bodies of tissue meeting the two indications I have named would be unwarranted as the lymphoid tissue is not a cause *per se,* but only a manifestation of systemic conditions.

103 State Street.

THE STATUS LYMPHATICUS, WITH PARTICULAR REFERENCE TO ANESTHESIA IN TONSIL AND ADENOID OPERATIONS.*

BY W. HUMES ROBERTS, M. D., PASADENA, CAL.

In and about Los Angeles, so many deaths have recently occurred under general anesthesia, either during or immediately following minor operations, such as the removal of tonsils and adenoids, that it seems advisable to look into the subject to see if such sad occurrences can be prevented in the future. The subject of deaths from anesthetics has been thoroughly gone into in the past, and, by most investigators, it has been ascribed to a condition existing in the patient which has been termed the "status lymphaticus" or the "lymphatic constitution." I make no claims for originality for what I am about to present, but I simply wish to set forth some well established facts in connection with the status lymphaticus, with the hope of thus refreshing the minds of all present, in order that we may be placed more thoroughly on our guard, and that we may thus prevent deaths which are bound to occur if anesthetics are to be used as indiscriminately in the future as they have been in the past. Few physicians are capable of giving an anesthetic, and no one without medical training should *ever* give one. Nothing is more erroneous than the idea that anyone can give an anesthetic. Doubtless many deaths under anesthetics have been caused by gross or almost criminal carelessness.

This paper is to deal solely with those cases in which death has occurred when the anesthetic has been carefully administered by a proper anesthetist, and in which, in all probability, the status lymphaticus existed, as is shown in the report of one autopsy, In nearly all cases in which the status lymphaticus has been demonstrated at autopsy, enlargement of the thymus gland has been found. This enlargement, associated with sudden death, was first mentioned by Bichat in 1723, but the connection was then apparently overlooked until 1829, when Copp called attention to it. Little notice was paid to it until 1888, when Jacobi, in this country, and Grawitz, in Germany, took it up.

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*Read before the Western Section of the American Laryngological, Rhinological and Otological Society, in charge of the meeting of the Ear, Nose and Throat Section, California State Medical Soc., Apr. 21, 1908.

In 1889, Paltauf, of the Vienna School, wrote: "Hyperplasia of the thymus is physiologically, as well as anatomically, an element of a general hyperplasia, and is a result of a derangement of nutrition or metabolism which also causes a degeneration of the cardiac centers." He found at autopsy, in addition to enlargement of the thymus, a hyperplasia of the entire lymphatic apparatus; enlarged nodes all over the body; of faucial and lingual tonsils; of the intestinal follicles; enlargement of the spleen and hypertrophy of its follicles; changes in the circulatory system. Here he noted a true hypoplasia; the aorta and small arteries were smaller and thinner than normal, and there were signs of cardiac dilatation.

Kolisko,[1] who averages some 2,000 autopsies each year, with about six of these dying from cardiac paralysis due to chloroform, says: "In these cases we always find the condition known as the 'habitus lymphaticus.' The nature of this condition is (1) a persistent thymus gland, which has often become considerably enlarged through an increase of its lymphatic tissue; (2) enlarged lymph glands; (3) adenoid vegetations in the pharynx, enlarged follicles at the root of the tongue and in the pharynx; (4) enlarged follicles in the intestines and stomach. These conditions are accompanied by some dilatation of the heart; with no changes in the muscles or endocardium; or occasionally there is evidence of a previous cardiac dilatation, marked by thickening in the endocardium, but not recognized clinically. There is also very frequently found a hypoplastic condition of the arterial system."

Is it possible to recognize the status lymphaticus prior to the beginning of symptoms which generally terminate in death? Many physicians, especially those of the Vienna School, claim that it is in some cases. Blumer[2], quoting from Escderick, who is one of the foremost authorities, says: "The subjects of the status lymphaticus usually have a pale, thin skin, a pasty complexion, and a good pad of subcutaneous fat. Frequently signs of rachitis or scrofula are present. The superficial lymph glands, especially those of the neck and axilla, are enlarged. There is hypertrophy of the tonsils, the circumvallate papillae of the tongue, and the pharyngeal lymphatic apparatus (adenoids). The spleen is often palpable." There may be faulty development of the sexual organs, a thymus capable of percussion, and an increase of the lymphocytes in the blood. We should be very suspicious if, in addition to the foregoing, we obtain in children a history of dyspnea and laryngismus stridulus, and in adults a history of fainting attacks. It should also be kept in mind that rachitis and goitre are often associated with the status lymphaticus. It would seem reasonable to suppose in this connection that the status lymphaticus is probably the cause of the frequent deaths occurring after operations for goitre. It is thus seen that hypertrophy of the faucial and pharyngeal tonsils are among the symptoms found in the status lymphaticus. We must remove these enlarged glands, when of sufficient size to interfere with the growth and development of the patient, with the least possible risk and shock.

Blumer[2] says: "Individuals who are the subjects of the status lymphaticus are born with an instability of the mechanism regulating the so-called 'horror autoxicus,' at any rate, so far as the lymphatic apparatus is concerned, so that they are subject to intermittent attacks of lymphotoxemia which may lead to reflex nervous phenomena of various kinds, or may cause death from cardiac paralysis. During the attacks of lymphotoxemia, such individuals are especially susceptible to the action of the bacterial or chemical poisons, and also to physical and psychical shocks, which at these times may cause their death under circumstances which would be trivial to a normal individual." This would explain the deaths which have occurred following the injection of remedial agents—as in the well known case of Prof. Langerhans' son, who died soon after receiving diphtheria antitoxin hypodermically. This would also explain deaths following shocks, frights, trivial injuries, or after diving in cold water.

Blumer,[2] in concluding his comprehensive paper on the status lymphaticus, says: "(1) The condition known as the status lymphaticus is a definite pathological entity. (2) It is probably associated with, if not due to, a condition of intermittent lymphotoxemia. (3) It may be associated with sudden death; probably, as a result of lymphotoxemia alone in some cases, or as a result of the action of toxic, physical, or psychic injuries, which are rendered much more powerful than usual by the predisposing action of the lymphotoxemia. (4) In some cases the sudden death is undoubtedly mechanical and due to asphyxia from pressure of the enlarged thymus on the trachea."

Olmacher[3] says that many deaths from status lymphaticus are due to increase of intra-cranial pressure with sudden edema, the clinical picture depending on the site of the edema, and the resulting pressure. If the external surface of the cerebrum is involved, various convulsions of the motor apparatus occur; if the floor of the fourth ventricle, sudden cardiac or respiratory failure.

Most surgeons admit that to remove tonsils and adenoids properly, general anesthesia is necessary. What anesthetic is safest? Halstead,[4] in an able paper read before this society at its general meeting in Philadelphia, 1900, showed clearly the necessity of performing the adenoid operation on children under some sort of general anesthetic, in order to avoid the great shock to the child's nervous system, which would occur where no anesthetic is used, or when only cocaine is used locally. In addition to the fact that this operation cannot be thoroughly performed unless the child is unconscious, the shock would be sufficient to cause the death of any patient with the status lymphaticus, and this should condemn it. Halstead points out the great danger of giving chloroform to any child with adenoids or enlarged tonsils, whether being operated for them or for something else. The lymphatic tendency is most marked in children before puberty, and it is during this time that chloroform is particularly unsafe. The saying that chloroform is the best anesthetic for children is amply refuted by statistics. Chloroform is a decided depressant, and when with children there is added fright with violent struggling against the anesthetic, we have a combination that can readily bring on cardiac syncope in a patient often predisposed to it by the status lymphaticus. This complex is undoubtedly the cause of so many deaths under chloroform before operation is begun.

Sanford[5] has reported a death following the removal of adenoids under cocaine. Were cocaine more generally used, many deaths would undoubtedly occur, as young children are quite susceptible to its toxic effects.

Dr. W. J. McCardie,[6] in a recent article, reports thirty deaths from anesthesia, in which the status lymphaticus was demonstrated. These occurred as follows:

Following chloroform	17
Following ether	6
Following chloroform and ether	5
Following nitrous oxide	2
Following ethyl chloride	0
	30

Thus, in twenty-two out of the thirty, chloroform was used. The youngest patient was six months, the oldest fifty-five years. Twenty-four were under twenty years.

Dr. John Wyeth,[7] of New York, performs seventy-five per cent of his operations under chloroform, but when operating on children he uses ether, as he considers chloroform too dangerous.

McGuire[8] says: "Recent investigation, however, seems to show that ether is equally as dangerous (as chloroform) under similar circumstances." With this I cannot agree.

Dr. Hill Hastings, when house surgeon at the New York Eye and Ear Infirmary, went over the records of tonsil and adenoid operations, covering thousands of operations which had been performed during a period of five years, and he did not find a death. Indeed, I believe they have never had a death from the anesthetic in this operation, and ether is invariably used.

In personal communications from Dr. E. A. Crockett and from Dr. Philip Hammond of Boston, they report that they have never known of a death in Boston from ether in the tonsil or adenoid operation. I may add that, in Boston, ether is always the anesthetic used, and that the patient is placed in the upright position for the operation.

Among the thousands of operations covered by the reports of Hastings, Crockett and Hammond, there must have been some operations on children with the status lymphaticus; and yet, among these reports, there is not a fatal result, and all were operated upon under ether.

A few miles from Los Angeles, in a seaside town of some 10,000 inhabitants, there have been three deaths within a year—these occurred during tonsil or adenoid operations, and chloroform was used in each case.

In and about Los Angeles, the following deaths have occurred as the result of anesthesia. In only one case was autopsy permitted, and in this the status lymphaticus was found. In several others there is no doubt that this condition was present, but in absence of autopsies no positive claims can be made.

I wish to thank Dr. F. D. Bullard of Los Angeles, for his kindness in sending me the reports of most of these deaths.

CHLOROFORM.

Case 1. Boy, aged thirteen. Operation—Removal of tonsils and middle turbinates. The anesthetic was taken nicely, and the operation was completed with the patient in good condition. His pulse then became irregular, breathing shallow, and face suddenly blanched; after the beginning of artificial respiration, he gasped two or three times, and then expired.

Case 2. Child, aged three. Operation—Removal of adenoids. The surgeon had just started to remove the adenoids when it was noticed that breathing had stopped. It was then found that the heart had ceased beating. This child had previously had chloroform administered for circumcision. Was this a case of intermittent lymphotoxemia?

Case 3. Child. Operation—Removal of adenoids. The surgeon would not reply to my letters asking for details of the case.

Case 4. Child. Operation—Removal of tonsils and adenoids. This case is reported in the words of the surgeon in whose hospital service it occurred. "The patient, a girl twelve years old, was brought into the operating room at the ——— Hospital, anesthetized and ready for me to operate. I had never seen the patient before. My memory is that she was a healthy looking girl of about twelve years of age, of medium build, neither fat nor thin. The patient was not fully under the anesthetic, so operation was delayed until the anesthetizer stated she was fully anesthetized. My recollection is that not a long time elapsed before operating and not much anesthetic given, but I was not paying attention to that part of it. I remember, however, that there was no struggling during the removal of the tonsils and adenoids. The operation itself took a very short time, I should say not over three minutes. On completion of the operation I was struck at once by the extreme pallor of the patient and the fact that she was not breathing. There was no cyanosis. I do not remember whether the pulse was beating or not, nor whether the pupil was dilated or not, or responsive to light. Artificial respiration and other measures were promptly used, but without the slightest sign of return of the respiration or the heart beat. No autopsy was secured. Chloroform was used because I had failed to tell the interne my preference for ether. The interne told me he had examined the chest and that the heart was normal. The patient had only been in the hospital an hour or two, so that nothing was known of her."

Case 5. Adult. Operation—Extraction of tooth.

Case 6. Woman. Operation—Dressing surgical wound. Ether had been used at the operation.

Case 7. Adult. Operation—Lancing of carbuncle on the neck.

Case 8. Adult. Operation—Avulsion of the toe nail.

Case 9. Adult. Died while preparing the abdomen for operation.

Case 10. Adult. Died before beginning the operation; fear probably figured largely in this case.

Case 11. Adult. Tonic spasm of the jaw, and probably "swallowing of the tongue." The attendants were unable to open the mouth.

Case 12. Adult. Lancing of carbuncle.

Case 13. Adult. Uterine curettement at early stage.

Case 14. Adult. Uterine curettement at the end of the operation.

Case 15. Adult. Hemorrhoids. Death occurred during dilatation of the sphincter.

ETHER.

Case 16 Woman, aged thirty-six. Death occurred from edema of the lungs, one hour after a prolonged operation.

BROMIDE OF ETHYL.

Case 17. Woman, aged twenty-three, native of Sweden. Operation—Extraction of teeth. Three minutes after administering two drachms of bromide of ethyl, extraction was begun. One tooth had been removed with some difficulty, when the patient blanched and breathing became shallow. Artificial respiration was commenced, giving slight improvement of color, which immediately became bad again. Dr. Stanley P. Black made an autopsy, and his report is as follows:

"Body well nourished; subcutaneous fat tissue well developed. On removing the sternum, the thymus gland was situated beneath the manubrium, size 3 by 2 1-2 by 3-8 inches. Lungs normal. Heart—left ventricle well contracted, right ventricle flabby; cavity empty, valves normal. Liver normal. Spleen somewhat enlarged. Pancreas normal. Kidneys normal. Intestinal tract, the solitary follicles at base of the tongue in esophagus, stomach, duodenum, jejunum, ileum and colon quite prominent, standing up under mucosa like shot. Peyer's patches likewise swollen. Glottis normal. Diagnosis—Paralysis of right ventricle. Status lymphaticus."

The records of the deaths of some of the patients under chloroform anesthesia have shown a history of having successfully taken this anesthetic once, only to succumb to a later administration of it. An intermittent lymphotoxemia could easily account for this, the lymphotoxemia being in abeyance at the first and present at the fatal administration. Whether or not death would have occurred in these cases if ether had been used, it is impossible to say. We do know, however, that in most of the fatal cases, cardiac paralysis occurred; and that chloroform is a cardiac depressant, while ether is a cardiac stimulant.

The status lymphaticus is most common in the first decade. Is it merely a coincidence, then, that in this decade a greater proportion of deaths occur from chloroform than from ether?

SUMMARY.

1. We should always keep in mind the possibility of the status lymphaticus being present in children who have enlarged superficial lymph glands, adenoids, or signs of rachitis.
2. In the status lymphaticus, *all* anesthetics are dangerous, but particularly, chloroform.
3. In *all* operations on children, avoid *chloroform.*
4. In operations for the removal of tonsils and adenoids, ether is the safest anesthetic to use.

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SOME SURGICAL EMERGENCIES ASSOCIATED WITH THE TUBERCULOUS LARYNX.*

BY CHARLES PREVOST GRAYSON, M. D., PHILADELPHIA.

I am quite aware that the small group of cases of which I shall speak represents a series of conditions that, while they can lay no claim to novelty, yet possess a clinical interest which arises largely from the very fact of their frequency. My purpose in reporting them is to give support to my assertion that they are of much too frequent occurrence, that they are almost if not always preventable, and that the responsibility for their occurrence is to be laid elsewhere than at the door of the laryngologist. As compared with others of the laryngeal complications of pulmonary tuberculosis, these cases of mine may not, perhaps, be regarded as among those most common, but I wish to submit to you the question as to whether it is not extremely seldom that there is any excuse for their happening at all. Speaking for myself, I have no hesitation in saying that there should be no such thing as emergency surgery in connection with the tuberculous larynx, and I say with equal emphasis that there would be no such thing if the general practitioner acquired the habit of placing the larynx of each of his tuberculous patients under the protection of the specialist either at the moment that there was reason to suspect its implication in the disease, or, better than this, even before such reason became apparent. I shall venture to tax your patience with no more than simply the essential clinical details of three comparatively recent cases in my own practice.

The first, a man of forty, with but moderately active involvement of the upper portions of both lungs, who had been under treatment for five months and who had developed laryngeal symptoms something more than a month previous to my seeing him. The request for my assistance arose from a rapidly increasing dyspnea which by the time I reached him in one of the suburbs of Philadelphia, was so extreme as momentarily to threaten death. A hurried glimpse of the larynx disclosed a general infiltration moderate in degree everywhere but in the interarytenoid space. Here, however, it was of such prominence that the cords were widely separated and through the interval between them I could see that the seriously obstructive condition was a sub-glottic edema or infiltration. Under the circumstances I would have preferred a low tracheotomy, but there seemed scarcely time for a careful dissection or anything that would have prolonged the dyspnea by a single unnecessary moment, and so the high operation was performed. The patient is still living, the enforced rest has greatly benefited the larynx, but the outlook for recovery is quite hopeless. If a few weeks earlier, the larynx had been properly cared for I am confident that no such condition would have developed within it and that the ultimate result of the case might have been a happier one.

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*Read before the thirtieth annual Congress of the American Laryngological Association, Montreal, Canada, May 11-13, 1908.

The second of these patients was a lad of nineteen whose pulmonary disease was of about two years' standing. Fully three months before my summons, laryngeal involvement had been announced by vocal impairment and this had been allowed to progress without any interference until there was complete suppression of the voice. Ten days previous to my visit pain had been added to the aphonia, had rapidly increased, and within another day or or two dysphagia and dyspnea made an almost simultaneous appearance. It was the seemingly imminent necessity for tracheotomy that called me to his bedside. The mirror disclosed an enormous swelling of the tissues enveloping the left arytenoid, the color of the tumor being sufficient of itself to indicate its purulent contents. With the patient recumbent and his head lowered the abscess was freely incised. The following day the subsidence of the swelling permitted the remnants of the deeply ulcerated cords to be seen and it became clear, I thought, that a perichondritis of the arytenoid had, as the result of a secondary pyogenic infection, eventuated in the abscess formation. Am I over credulous in believing that this condition also could not only have been prevented, but easily so by timely treatment of the affected cords?

The last case of the three was that of a woman of twenty-eight in whose larynx there had been interarytenoid ulceration of sufficiently long duration to have developed a prominent mass of granulations sprouting from its edges, and, in addition to this, extreme infiltrative swelling of both aryteno-epiglottic folds. As the result of a wetting and subsequent chill due to a sudden shower while she was out driving, an acute inflammatory edema encroached still further upon the already narrowed glottic space and compelled an immediate tracheotomy. Again I contend that the necessity for surgical intervention in this case as in the others would not have arisen had systematic inspection of the larynx been adopted earlier in the course of the disease.

Surely, "he who runs may read" the lesson that should be taught by such cases as these, yet their continued daily occurrence not only in the country districts but in the very midst of our large cities shows that it is still unlearned. I fancy that few if any of us will doubt that if early co-operation between the general practitioner and the laryngologist became the rule rather than the exception, the large percentage of secondary infections of the larynx occurring during the course of pulmonary tuberculosis would be very materially reduced. The frequency of such involvement, as shown by the records of the post-mortem room, is at this day inexcusably large, and inferentially it suggests the surprisingly small proportion of these cases that are permitted to enjoy either the prophylactic or the curative aid, so far as the larynx is concerned, that the laryngologists might extend. This proportion, as it relates to the large number of charity cases that find their way to the post-mortem table, is, I am inclined to think, but very little larger than that that would be shown by a strict record of private patients if such were obtainable. For various reasons, more or less open to criticism, many of these unfortunates are allowed to develop laryngeal lesions which, receiving no better treatment, perhaps, than that afforded by cocaine and orthoform lozenges, medicated inhalations of doubtful utility, and gargles concerning the harmfulness of which there can be no doubt, steadily progress to the stage at which, pain and difficulty seriously crippling nutrition, the patient loses his one and only chance of recovery. I maintain that the physician who, without incontestable reason, permits this sort of thing deserves the pillory of professional criticism no less than he who incompetently temporizes with a purulent median otitis complicating an infectious fever until the mastoid and the cranial cavity are invaded.

251 South Sixteenth Street.

REPORT OF A CASE OF REMOVAL OF A FOREIGN BODY, A GRAIN OF CORN, FROM THE TRACHEA OF A CHILD SIX YEARS OLD.*

BY J. H. BRYAN, M. D., WASHINGTON, D. C.

The following is a short account of a successful case of the removal of a foreign body from the trachea of a child by tracheotomy, after an unsuccessful attempt at tracheoscopy had been made.

Paul B., aged 6 years, was admitted to the Episcopal Eye, Ear and Throat Hospital January 22d, 1908, giving the following history:

Several days before his admission to the hospital he was playing horse, and while in the act of munching corn from the cob, a large grain was drawn through the larynx into the trachea. He was seized with violent coughing and dyspnea; but he soon quieted down to such an extent that when his family physician examined him he could not find any difficulty with the breathing, and concluded that the grain of corn had not passed into the trachea. During the night, however, he was seized with several very severe attacks of dyspnea and coughing, which continued through the following day, when the breathing became quiet again. He was then brought to Washington and admitted to my service in the Eye, Ear and Throat Hospital January 22d.

On admission, I made a careful examination of the child, and found him suffering from a large hypertrophy of the post-nasal lymphoid tissue and hypertrophy of the faucial tonsils. His color was natural, his voice thick and somewhat husky, which could be accounted for by the enlarged tonsils and the adenoid. The respirations were somewhat quickened, but not more so than one would expect in a timid child when in the presence of strangers. Ausculation showed large and small mucous rales over both sides of the chest anteriorly and posteriorly. The air apparently entered the lungs freely.

An X-ray picture was made, but it did not reveal the presence of a foreign body in the air passages. He was kept in the hospital under close observation for three days, but as no dyspnea was observed in this time he was allowed to return to his home in Maryland.

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*Read before the thirtieth annual Congress of the American Laryngological Association, Montreal, Canada, May 11-13, 1908.

On the morning of January 30th, he returned to the hospital suffering from intense dyspnea and marked cyanosis. An examination of the lungs at this time showed a complete absence of the respiratory sounds on the right side, while mucous rales were heard on the left side both anteriorly and posteriorly. When I saw him about two and a half hours after his admission, these physical signs had completely changed. The air was found to be passing freely into all parts of the lungs. He was still breathing with great difficulty and complaining of intense pain in the subglottic region. Evidently the foreign body which had been engaged in the large bronchus on the right side had been dislodged and had been carried into the upper part of the trachea, where it was caught by the swollen mucous membrane.

I had him sent to the operating room, and placed under chloroform anesthesia with the view of trying to remove the body through a Killian tracheal tube. I made several ineffectual efforts to pass the small tube through the larynx, but owing to the swollen condition of the mucous membrane lining the larynx, I found this was impossible; just at that moment the child ceased to breath and became very cyanotic. I then did a rapid tracheotomy, expecting to pass the tube through the tracheal opening and remove the foreign body in this way. As soon as the trachea was opened the child commenced to breath freely again, a grain of corn was seen to pass the tracheal opening on its way to the lower trachea. It made several such excursions before I was able to grasp it with my forceps and remove it. A tracheotomy tube was then introduced into the tracheal opening. He rallied quickly from the operation, and as all obstruction to the respiration ceased after the removal of the foreign body he was sent to his bed.

When the grain of corn was removed it was found to be an unusually large one, and very much swollen from the moisture absorbed since its introduction into the trachea.

The tracheotomy tube was removed on the fourth day, and the wound allowed to close. Some laryngeal stridor remained for at least twenty-four hours longer, when it ceased. The patient made an uninterrupted recovery, and was discharged from the hospital on the ninth day.

This case is interesting, and shows it is not always best to persist in passing the Killian tube through a swollen larynx after several ineffectual attempts have been made. Had I continued my efforts to reach the trachea in this way, I am sure I would have done irreparable injury to the soft parts, and had I succeeded in introducing the tube through the larynx it would have been impossible to remove a grain of corn of this size through the tube, but with a large tube introduced through a tracheal opening I might have been able to reach the foreign body and remove it. Fortunately the introduction of the tube through the tracheal opening in this case was not necessary, as the above history shows.

818 Seventeenth Street.

Critical Remarks upon Empyema of the Saccus Endolymphaticus, and the Importance of the Aqueductus Vestibuli as a Path of Infection. OSCAR WAGENER. *Archiv fur Ohrenheilkunde*, July 1906.

The author reports a case of cerebellar abscess, in which the abscess was adherent to the posterior surface of the petrous portion of the temporal bone, in the neighborhood of the opening of the aqueduct of the vestibule. Careful microscopical examination revealed the fact that the abscess was caused by perforation of a bone abscess through the dura. The dura was infiltrated with pus, but it could be clearly seen that the saccus endolymphaticus was free from pus, although surrounded by infiltration. The aqueduct was also free from exudate.

In all the cases reported in the literature, in which it was claimed that infection had travelled from the labyrinth through the aqueduct and sac to the cerebellum, the author could find only one case in which microscopical examination showed the presence of pus in the sac and aqueduct, the case of Pollitzer; and the author is inclined to agree with the latter in the view that such a mode of infection is an unusual one. The infection generally travels by direct extension through the bone.

YANKAUER.

REPORT OF A CASE OF ANGIO-MYXO-SARCOMA OF LARYNX WITH EXPULSION OF LARGE TUMOR.*

BY L. ROSA H. GANTT. M. D., SPARTANBURG, S. C.

While I have nothing brilliant in the way of results, and nothing new to advance in this report, I feel that this case is of sufficient interest to the laryngologist to be put on record. Primary sarcoma of the larynx as compared to carcinoma is quite infrequent, but angio-myxo-sarcoma is quite rare, there being but a few recorded cases, and this fact, coupled with the belief that every case of malignant growth in the larynx should be put on record, is my only reason for making this report.

On April 7th last, patient came to me complaining of irritable throat, some pain on deglutition, and slightly labored breathing on exertion or on mounting stairs, which he had noticed for about six weeks, but as he thought it due to excessive smoking on his part, did not seek medical aid until urged by his friends to do so. Patient's general appearance was bad, and voice was of very low pitch, weak and husky. Examination showed fairly healthy nose, naso-pharynx and upper pharynx, but there was so much irritability in the throat and excessive secretion of saliva, that even with a cocaine spray three visits were consumed in making the throat tolerant of laryngeal mirror, and on the fourth day a large mass, which seemed to almost fill the space, was made out on the right side of larynx below the cords, the exposed portion showing a dirty, sloughing surface. Patient was told that he had a growth in his larynx, and was questioned more closely as to history, which is as follows:

Mr. B., age 67, expert soap maker, average weight 132 pounds, has lost fifteen pounds in past year. When about forty years of age had severe skin eruption on hands and face, which required treatment for several months. About six years ago had a number of carbuncles, confined to legs only, and which left deep cicatrices. Patient had always led an active life, and except for the two periods of ill health, above mentioned, always felt well and had good appetite; he denied syphilis.

Family History—Nothing known of grandparents. Both parents, one sister and one brother, died of old age, one brother died at 56 of tuberculosis; another, who led a very dissipated life, died at the age of 60. One sister died during pregnancy, aged 28. The only remaining member of family beside himself—a sister, aged 72—he thinks has cancer of the stomach, but doesn't know this positively, as he hasn't seen her for six years. On the day of patient's fourth visit to me I requested him to return to my office in the evening, as a laryngologist from an adjoining town would then be in my office, and I wished him to see the case with me. Dr. Carpenter, of Greenville, S. C., agreed with me that the condition of patient was serious, and advised him either to return to his family in the North or permit us to operate on him immediately, stating that unless the growth was removed very soon there was grave probability of his choking to death. Patient declined operation and decided to wait here for several days and wind up his business before returning to his home. On the sixth morning Mr. B. walked into my office with a large tumor in his hand and gave me this history:—He slept well the night before, voice was clearer, and his throat felt so comfortable that he expected to enjoy a hearty breakfast, but on attempting to swallow found throat quite painful. After being at his office—possibly half an hour—he began expectorating a little blood, and a carriage was ordered in which to send him to my office, but before the carriage arrived patient had coughing attack and feeling of suffocation and, being much alarmed, made frantic efforts for breath and ejected the growth, which was thrown about four feet away. About half-pint of blood was ex-

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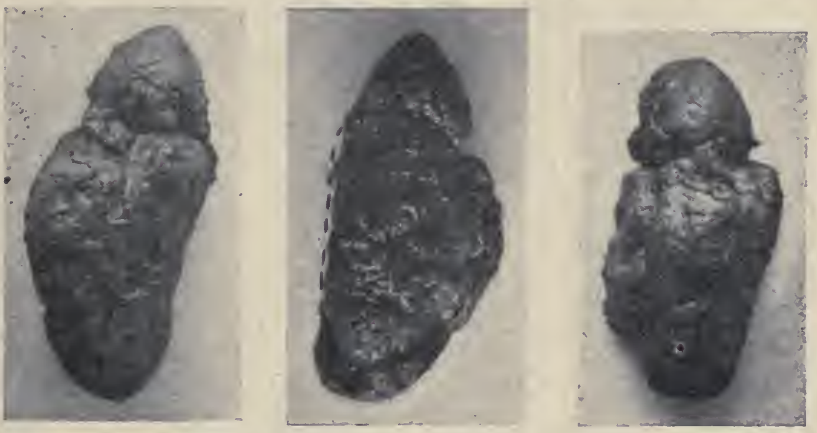
*Reported at meeting of Spartanburg Medical Society.



1. Exposed Surface. 2. Attached Surface (dotted lines represent attachment). 3. Attached Surface.

pectorated, but patient did not feel weak, and arrived at my office unattended ten minutes after expulsion of the growth. The larynx was examined with as little manipulation as possible for fear of exciting hemorrhage, and a growth about the size of a hazel nut was seen with a clean, raw surface, but no oozing of blood. Patient was sent to bed and ordered not to talk, and to partake of no food but iced milk until I could see him later in the day; he was then found quite comfortable, pulse good and strong, temperature normal, and no bloody expectoration, and having a sense of great relief in throat. On examining growth it was found to be two inches in length and one inch in diameter, its attached surface being nearly as great as its exposed surface—as shown by dotted line in picture 2. The exposed surface, illustration No. 1, was rather nodular in appearance, of greenish color, and much firmer than the attached portion, which latter, however, did not look like a sloughing surface. The tumor was submitted to microscopic examination, and in the meantime the patient was carefully watched, given supportive treatment and larynx cleansed daily with alkaline spray, but as his relief was so great it seemed difficult to make him realize that his condition was still serious. After a few days there was rapid development of the growth, and at the end of a week this second growth was almost, if not quite, as large as the one which had been expelled, and the patient was advised to have growth removed through external incision, but as he was quite anxious to attend to some business in a city several hundred miles distant, he was urged to go at once and to consult a specialist there. This he did, and growth was removed under local anesthesia, with snare and scissors through mouth, and this growth was also submitted for microscopic examination. The specimens being difficult to harden for section some little time elapsed before the report of angio- myxo-sarcoma was sent in by the pathologists. Two weeks after operation Mr. B. returned to Spartanburg, and on examining him I saw that the growth was much larger than ever before, and was rapidly encroaching on the esophagus. The growth being of such rapid development, and the patient in very bad condition, he was sent home to his wife and son to spend his last days, which seemed few in number, and which proved to be so, as he died from exhaustion six days later.

I wish to acknowledge the assistance given by Dr. J. Austin Ball, of Charleston, S. C., who made the pathological examination.

SUPPLEMENTAL REPORT OF A CASE OF XANTHOMA, WITH EXHIBITION OF PATIENT.*

BY JOHN EDWIN RHODES, M. D., CHICAGO.

I presented this patient before this Society in May, 1906. (THE LARYNGOSCOPE, October, 1906.) A few days after his presentation here, it became necessary to do tracheotomy to relieve his breathing. He is now wearing a tracheotomy tube, and has done so since that time. Permit me to recall a few points as to the disease, and the history of this patient, for the benefit of those who did not see him at that time. Briefly, xanthoma is a perfectly benign neoplasm, and is of a fibro-fatty character, deposited in the corium. This patient presents the two forms in which the disease is usually seen, the plaques and nodules. There were also the lesions as they are found on mucous membranes, although those that were present in the fauces have disappeared, that on the conjunctiva of the left eye is much less prominent now than then, and had at one time disappeared entirely.

The multiple forms seen here are rare in one individual, and when found in young people are usually congenital, but when found in adults are often associated with chronic jaundice, or with blycosuria, as in this case. The most common form is the xanthoma palpebrarum, which is not so rare. The lesions on the eyelids were marked when this patient was shown before, but have almost entirely disappeared now. The lesions on the skin have a deposit of pigment, varying from a light yellowish or brownish color to a deep bronze. The very rare condition shown here, the patches on the conjunctivae, are of a light yellowish color, and while that on the right eye is large, its position is such that it does not affect his vision, and is absolutely unirritating in its presence. The lesions on the neck have faded somewhat, but those about the shoulders, the gluteal region, the penis, the scrotum, etc., remain about as they were. They are little indurated, except the nodules on the penis, are little raised from the surface, and over some parts of the body are smooth and level with the surface. The patient is twenty years of age, the mother is living and well, and the father died of cerebral hemorrhage about three years ago. There is no history of any similar disease in the family. He has never had any severe illness, there has been no venereal trouble, and he has never used alcoholics or tobacco.

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*Presented at the meeting of the Chicago Laryngological and Otological Society, April 14th, 1908.

His present illness began about six years ago, the first symptoms being an intense itching of the eyelids, shoulders, etc. This was felt at intervals, and finally the eruption appeared simultaneously on the eyelids, neck, shoulders, penis, scrotum, and other parts of the body. Four years ago he began to have an intense and constant thirst, and to pass large quantities of urine, which now amounts to from seven to nine quarts a day. When he was first presented to the Society he complained of spells of dizziness and faintness, lasting a couple of minutes at a time, at intervals of two or three weeks at first, which had gradually increased in frequency to several attacks daily. In addition to this symptom there was an increasing difficulty in breathing, which was progressive in severity, and was very marked at that time. This became so pronounced that the tracheotomy was performed on the third of May, 1907.

This is the point in this case that makes it one of peculiar interest to the laryngologist, for it is the only one on record, so far as I know, where a xanthomatous lesion in the larynx has caused enough obstruction to necessitate such a procedure. When he was examined in 1906 the soft palate showed small, irregular patches of congestion, not raised from the surface, and without pigmentation. There was a slightly nodular condition of the pharynx. The right pillar of the fauces was somewhat contracted at the site of an old lesion, as was also the tip of the epiglottis. In the larynx, the nodules were so thickly placed that the vestibule was almost occluded, leaving only a small opening of two or three millimeters between the vocal bands and the vocal cords, for the passage of air. In a recent examination, I found that the lesions in the fauces had practically disappeared. Thorough cocainization is necessary to examine the larynx, when drawing forward the epiglottis gives a good view. The change here is marked, the swelling having subsided about fifty per cent, so that the vocal cords are now visible, in part, and respiration through the larynx is fairly easy. The patient, however, has often experimented in removing the tube for a time, but has found it necessary to replace it, as his breathing soon became too labored for comfort. I hope, from the improvement that has taken place, that he will some time be able to remove the tube permanently.

His general health is now excellent. His gain in weight since the tracheotomy has been forty pounds, and during all the inclement weather of the past winter he has followed his occupation, driving a milk wagon. I would call your attention to his voice, which is clear and strong, and which can be heard in all parts of the room, without closing the opening in the tube, which he protects with a few thicknesses of gauze. At first I gave him a tube with a ball valve, which allowed the ingress of air, but was closed on expiration. He discarded this very soon as he could not breathe easily. I then substituted one with an oval opening in the upper surface of the tube allowing free passage of air from the trachea to the larynx. This opening has seemed unnecessary, and since February 1 he has worn an ordinary tube and the amount of air passing around it to the larynx is sufficient for good vocalization.

100 State Street.

Parotid Fistula after Mastoid Operation. F. KRETSCHMANN. *Archiv fur Ohrenheilkunde*, July 1909.

Two of these unusual cases are reported. In both cases, a fistula occurred in the scar of a mastoid wound. In one case during the course of the healing of the original wound, in the other following a slight injury three years after the wound had healed. In both cases, the opening of the fistula was situated at about the level of the tip of the mastoid. The fistula was about two centimetres long and was directed upwards and inwards. In both cases a clear, thin watery fluid was discharged, the amount increasing markedly during mastication.

A fistula with a lymph-gland at the bottom would also discharge a large quantity of fluid; but the fluid in such cases is milky and contains fat. These characteristics were not present in the author's cases, but unfortunately a chemical examination of the fluid, which would have definitely established its origin from the parotid gland, was not made.

Both cases were cured by repeated cauterization with solid nitrate of silver, fused on a probe.

YANKAUER.

Tracheotomy in Slight Respiratory Obstruction Associated with Febrile Toxæmia. A. O. Bisson. *Lancet*, Jan. 26, 1907.

In fever practice there is a type of case occasionally encountered in which toxaemia is accompanied by very slight, apparently inconsiderable obstruction of respiration. Such cases are commonest in septic scarlatina, and now and then is seen in small-pox. There is also a septic type of diphtheria defined by Monti, in which the larynx is but little affected; there is slight obstruction, but it is not progressive, and the patient apparently dies as a result of the toxaemia.

The indications for tracheotomy in this type of cases are:

(1) *Difficult breathing.* In addition to the usual cause of obstruction there is not uncommonly marked lymphadenitis on both sides of the neck. This is often accompanied by edema, and even in some cases by an acute inflammation of the subcutaneous tissue of the neck,—possibly causing pressure on the trachea. Stress is laid on the fact that the obstruction is usually extremely light. It is its duration which tells on the general condition, and especially, on the strain of the heart.

(2) *Restlessness.* With this there may be return of fluid through the nose, cyanosis and extreme exhaustion.

(3) *Recession* is usually very slight, or even absent; it is only extreme in cases of laryngeal diphtheria.

(4) *Condition of the heart.*

(5) *Condition of the pulse.* There may be a typical pulsus parodoxus,—a sign of extreme gravity.

(6) *Color of the face,*—slight lividity about the mouth and nose.

(7) *Septic laryngitis.*

Tracheotomy has been done during the last one or two years for haemorrhage from the naso-pharynx in which the plugging of the posterior nares did not arrest the bleeding.

After tracheotomy the inprovement within a few hours is remarkable. It is better to operate under a local anaesthesia. A high and rapid tracheotomy with a small incision is recommended.

In children under three the prognosis is not so favorable.

Thomson.

SOCIETY PROCEEDINGS.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, May 12, 1908.

A. H. ANDREWS, M. D., PRESIDENT.

Dentigerous Cyst. By NORVAL H. PIERCE, M. D.

DISCUSSION.

DR. JOS. C. BECK: I have a case of dentigerous cyst of the follicular type. The patient had symptoms of antral trouble for several months. On examination I found the nasal cavity free from any pathologic condition. There was extreme tenderness over the antrum and alveolar process. At the floor of the antrum in the region of the bicuspids, there was a marked swelling and considerable tenderness. Two teeth were missing. A radiograph showed the teeth, contorted and misplaced, in the jaw. An incision was made over the swelling in the roof of the mouth, which led us into a cavity filled with grumous fluid. The teeth were removed, and the cavity was packed but did not heal. Later the walls of the cavity were scraped, the cavity was filled with a Mosetig-Moorhof plug, a flap taken from the gums. It finally healed. The patient has been entirely free from any inconvenience since then and wears a plate to supply the missing teeth. I hereby present this patient to show the excellent result. I also want to call attention now to the obliteration of the antral cavity in empyema by means of the injection of the bismuth-paraffin paste advocated by Dr. Emil Beck.

DR. GEORGE E. SHAMBAUGH: I wish to emphasize a point mentioned by Dr. Pierce regarding the symptoms of bulging of the external wall of the antrum in these cases. It is interesting to note that the older writers on the diseases of the maxillary sinus referred to ectasia of the facial wall as one of the most characteristic symptoms of empyema of this sinus. It was later demonstrated that invariably in those cases where an ectasia of the facial wall existed an empyema of the antrum was not present, but that by puncturing the sinus a clear fluid was found. These cases were still considered cases of antrum disease and in the literature were described as cases of "hydrops antri." We now know that those cases of "hydrops antri," that is, cases where on puncture a nonpurulent fluid is found, are not cases of antrum trouble primarily, but are cases of maxillary or dental cysts which on enlarging encroach on the cavity of the antrum as well as produce an ectasia of its external wall.

Dr. J. Holinger: Owing to an observation made within the last few weeks I have to disagree with Dr. Shambaugh. Not all swellings of the anterior wall of the antrum are due to cysts. Only yesterday I operated on a woman who had a swelling of the antral wall caused by a tumor. Several pieces were removed from different parts of the tumor and examined by different pathologists who agreed on the diagnosis granuloma. Upon clinical appearance I diagnosed sarcoma, which was found correct after the tumor was removed. The patient said that one side of her face had been swollen ever since she could remember, but that she had never had any trouble from that source. A photograph taken twenty years ago showed the swelling. Therefore I would not say that in all cases bulging of the anterior antral wall is due to a dentigerous cyst.

In this connection I want to remind you of the boy I showed you some years ago who had an abscess of the septum of the nose, and where a tooth appeared later in the front part, at first entirely out of place. That tooth is gradually growing into its normal position. Small sequestra are discharged, and appear every once in a while, either at the root of the teeth or at the base of the septum. There is only a membranous septum but no cartilaginous septum. I do not think that all cases of abscess of the septum of the nose ought to be attributed to errors in dentition.

Dr. Shambaugh: I had no intention of giving the impression that in all cases where there is a bulging of the antral wall a dentigerous cyst is present. I intended to say that no case of empyema of the antrum will cause an ectasia of the external wall of the antrum. This may be caused, of course, by a tumor.

Dr. Norval H. Pierce, (closing the discussion): I mentioned that we can have dilatation of the antrum accompanying tumors, and there may be a swelling of the face over the antrum in empyema of the antrum. when an osteomyelitis is set up, but that is not a dilatation. The history of such a case is so distinctive that it is impossible to err in the diagnosis.

Non-Suppurative Involvement of the Labyrinth in the Course of Mumps with Report of Two Cases. By G. H. Boot, M. D.

A review of forty-nine cases from the literature and report of two additional cases from which he concludes that this complication occurs chiefly between the ages of 11 and 30, being slightly more common in the female. It is rapid in its onset and of three types:

1. Chiefly involving the cochlea and manifested by deafness of a labyrinthine type and tinnitis, but with little or no dizziness or vomiting.

2. Chiefly involving the semi-circular canals and manifested by vertigo and vomiting, with little or no deafness.

3. A combination of the preceding. The prognosis as to recovery of hearing is bad.

Treatment of the deafness is most apt to be successful if used early.

DISCUSSION.

DR. HARRY KAHN: It is important that one know the condition of the hearing in these cases before the attack of mumps commenced. If the labyrinth alone is involved, there is a short negative Rinné.

He makes no mention of testing the hearing for high tones, which is of great importance in the determination of labyrinthian disease and function. He also gives no data as to nystagmus. I would also take exception to his classification. I think that when the semicircular canals are involved the loss of hearing is complete in the cochlea, whereas in loss of hearing in the cochlea, the semicircular canals are not necessarily involved; but I do not believe that we can get involvement of the semicircular canals without involvement of the cochlea.

DR. GEO. E. SHAMBAUGH: This paper brings up the interesting condition of involvement of the internal ear in infectious disease. I had an opportunity of examining this case, and I saw one other case about five years ago, a young girl, 12 years of age, who had an attack of mumps. On the first day of the attack she suddenly became deaf in one ear accompanied by severe nausea and a period of vertigo lasting several weeks. I examined her several months afterward, and so far as I could ascertain there was no hearing left in one ear.

It is very interesting if it is true that one may have different parts of the labyrinth involved separately in this disease. From the clinical reports Dr. Boot has collected, it does seem that there are cases in which only the cochlea is involved, in others only the semicircular canals, and in still others the entire internal ear is involved. If these cases have been correctly reported, this fact may possibly throw some light on the cause of the disturbance in the internal ear. Dr. Boot seems to consider it a mild form of infection and inflammation, but it seems to me that such an inflammation would be likely to involve all the structures of the interior ear. However, it may be possible that one can have an inflammation, mild in character, which will destroy the function in the cochlea and yet not in the vestibular apparatus.

The fact that separate parts of the labyrinth may be involved in this process suggests the probability that a process like embolism may be at the bottom of the trouble. The blood supply of the entire labyrinth comes through a single vessel, the labyrinthine artery, but separate branches form the sole arterial supply from distinct parts of the labyrinth because the labyrinthine arteries are of the type known as end arteries. The parts of the labyrinth that are thus separated by distinct arterial vessels are the horizontal and superior semicircular canals with the macula of the utricle, the posterior semicircular canal, the macula of the saccule, and the cochlea itself. With this division of the blood supply of the inner ear it is readily seen how a process like embolism might involve separate parts or the whole of the labyrinth.

Dr. A. H. Andrews: I remember a case in which there was deafness in both ears following an attack of mumps. A diagnosis had been made of hysterical deafness. I examined the patient and expressed the opinion that it was a case of labyrinthian involvement due to mumps and made a very unfavorable prognosis. The patient passed from my observation, and I can not make a further report.

Dr. Boot, (closing the discussion): In reply to Dr. Kahn's criticism, I wish to say that the patient was apparently totally deaf to the Galton whistle. In the other cases reported, its use was not mentioned. I did not test the patient for nystagmus. Possibly it was present, but it was not apparent without special search.

As to the classification, I do not see how we can classify these cases otherwise. Most of them showed involvement of both the semicircular canals and the cochlea, but a few of them showed such decided separate involvement. That these cases are probably much more common than is believed is doubtless true, but very few of them have been reported.

Exfoliation of the Labyrinth. By A. H. Andrews, M. D.

DISCUSSION.

Dr. J. Holinger: There are two pathologic processes that must be considered in this connection. One is pressure atrophy of the bone of the rear and upper wall of the external meatus. It is found in so-called cholesteatoma of the external canal. The bone shrinks through the pressure exerted by the enlarging cholesteatomatous masses. The second process is a true necrosis. I described a case of most extraordinary extent in my report of the examination of the children of the deaf-mute institution in Jacksonville about ten years ago. The entrance of the external canal was normal, but immediately inside of it there was a cavity the size of a small walnut which was filled with cholesteatomatous masses. In the center of this mass, there was a piece of necrotic bone about the size of a pea. There was no facial paralysis, but the whole mastoid process was excavated and lined with a cholesteatomatous membrane. Cases of this kind have frequently been described by Bezold as early as 1883, as well as in the catalogue of the Toynbee collection.

Dr. C. M. Robertson: In one case I saw, the posterior wall was bulging, and on probing it, the instrument dropped into a cavity that extended back to the tip of the mastoid and followed in to the inner ear. These are cases of subacute otitis. Finally the sequestrum of the posterior wall comes out and the ear heals. I think that that is not at all uncommon in tuberculous patients. Of course, a cholesteatoma would produce an effect of this kind. I think that many such cases of complete exenteration are reported, not only involving the mastoid but also the deeper portions of the internal ear.

Dr. Norval H. Pierce: I have seen but one case of this kind, occurring in a man over forty, who was sent to me by an insurance company. He gave a history of running ear for a great number of years, the origin of which was uncertain. His ear had been dry for some years before I saw him. On examination there was every evidence of a typical radical mastoid operation. The outer wall of the attic was gone and there was a large opening where the atticus had been, about the size of a filbert. There was a strand of connective tissue running from the roof of the attic to the Fallopian canal. There was not the least moisture; the hole was covered by a cholesteatomatous membrane, dry, glistening, partially clear, and the hearing in the ear was exceptionally good.

Dr. J. C. Beck: Dr. Dench showed an exfoliated cochlea, where, after healing had taken place, the test showed that the patient could hear in that ear. There must have been some remnants of the cochlea present in which hearing was preserved.

Dr. A. H. Andrews, (closing the discussion): In this case the ear was suppurating, the bone conduction was down and the hearing was so bad that the patient used a tube. In the ear which I have described, bone conduction is almost gone, and hearing is not good, although in my tests with the speaking tube I could not discover that the patient could not hear as well in that ear as in the other, showing that she must have some hearing. My observation of these cases is that in the tuberculous cases the bone comes away in a sequestrum, but in both my cases there was no history of any pieces of bone coming away, and I do not believe that one could say, from the history and the present conditions, that it could have been a cholesteatomatous process. I have two specimens of exfoliated labyrinths but I got them in attempted mastoid operations. In the case reported tonight, with the exception of the small canal which I would not like to exhibit as a radical mastoid operation, I would be glad to exhibit the case as an evidence of my skill in doing a radical mastoid.

Differential Diagnosis Between Involvements of the Labyrinth and Hysteria in a Case of Double Suppurative Otitis Media.

By J. Holinger, M. D.

DISCUSSION.

Dr. Norval H. Pierce: In probably the greater number of cases of acute otitis media of severe type the internal ear is involved. This is proved by the fact that in a number of these cases the high tones are reduced either permanently or for a long time. I recently had a couple of cases return to me after ten and twelve years. There was a severe suppurative inflammation, but everything healed up and now I find in the ear most involved marked nervous deafness. These cases need not necessarily be suppurative processes but they may be plastic processes, and when we think of destruction of the internal ear, the easy access of microorganisms or their ptomains, it seems strange that this is not more frequently the case in involvement of the internal ear.

I would like to have Dr. Holinger tell us something about the temperature in his first case. It has been stated that in suppurative cases confined to the labyrinth there is no elevation of temperature. That is a queer statement, yet coming from such a good man as Bezold, it is of importance.

Dr. Harry Kahn: The differential diagnosis of hysteria and internal ear disease is of great interest to me. In looking over the literature I find that everybody agrees that the hysterical ear may give the tuning fork test, which, if it is the only sign present, one may take for a pure labyrinthian deafness. Hammerschlag shows that in labyrinthian deafness we do not have any organic changes and that tinnitus or vertigo are against hysteria and for an organic change. His test for hysteria is to note the difference between the whispered voice and the tuning fork. The former is heard three to six meters, whereas the tuning fork gives only the pure labyrinthian reaction. So that it is different from what we would expect. In hysterical deafness there are other manifestations of hysteria, and especially the loss of the sense of touch or a reduction of it, localized usually in the external meatus and even the membrani tympani may be anesthetic. So that it seems that in hysteria we do not have any organic change, whereas in the other, where there is vertigo, it is purely organic.

Dr. Geo. E. Shambaugh: It is not an uncommon thing to find marked symptoms of labyrinthine deafness come on during an attack of severe acute otitis media, and sometimes it persists permanently. A patient with good hearing, whom I saw recently, had a severe attack of acute otitis media in both ears. The patient heard nothing above mark "14" of the Edelmann Galton whistle in one ear and nothing above mark "9" in the other ear,—a marked degree of labyrinthine deafness. This defect was reduced to mark "5" and "4" for the two ears about three weeks after suppuration subsided. I do not think that this was a purulent inflammation in the labyrinth. A pus invasion, I believe, almost invariably results in total destruction of function.

In regard to the second case reported by Dr. Holinger it is interesting to find these cases of otosclerosis where the symptoms are those of labyrinthine deafness and not of anchylosis of the stapes. The first cases where a diagnosis of otosclerosis was clearly made, both from middle ear disease and from nerve deafness, were the typical cases of anchylosis of the stapes and the postmortem findings discovered in these the spongifying process limited to the region of the oval window. For this reason the term otosclerosis has in the minds of many often been taken synonymous with bony fixation of the stapes. As a matter of fact the underlying pathological process, that of spongifying of the capsule of the labyrinth, may take place in parts of the capsule at a distance from the oval window, thus producing the symptoms typical of labyrinthine deafness with an absence of the typical signs of fixation of the stapes.

It is of course comparatively easy to make a diagnosis of otosclerosis in cases where the process has produced a fixation of the foot-plate of the stapes, provided there has not existed a previous middle ear disease to obscure the case. It is not so easy to make a diagnosis of otosclerosis when the foot-plate of the stapes has been left free, and when the deafness is of a labyrinthine type. In many of these cases the diagnosis will not be made except by the postmortem finding. Yet there are cases where the type of onset, the age of the occurrence of the deafness, the history of deafness in other members of the family, and perhaps the presence of Schwartz's symptom, the reddish glow transmitted to a normal membrana tympani from a congestion over the promontory, allows us to make a reasonably positive diagnosis of otosclerosis with spongifying of the capsule of the labyrinth, producing typical labyrinth deafness and none of the symptoms of middle ear deafness because the foot-plate of the stapes has been left free.

Dr. A. H. Andrews: I would like to ask Dr. Holinger whether there is any way of making an immediate positive diagnosis of hysterical deafness. I have not been able to say that this is absolutely a case of hysterical deafness, although I have been able to say that I believed it to be such, but when the patient got well suddenly, independently of treatment, I felt very sure that it was a case of hysteric deafness.

Dr. Holinger, (closing the discussion): Replying to Dr. Pierce, I can not say anything about the temperature previous to my examination. The temperature was taken regularly in the hospital and no rise was observed.

As to Dr. Andrew's question. The main point of my paper was to show that it was the tuning fork examination which really gave us the diagnosis, and this with absolute certainty. The psychic element was excluded and we had only objective findings to depend upon.

Regarding the second case, that of spongifying of the capsule of the labyrinth, Siebenmann in the last issue of the "Correspondenzblatt fuer Schweizer Aerzte," speaks of chronic progressive deafness as mentioned in Lucae's latest book. Siebenmann says that Lucae places the word "Otosclerosis" in quotation marks all through his book. This is to be supported from a pathologic-anatomical stand-point, because the progressive spongifying process which is at the bottom of the sclerosis, is not a sclerosis, but, on the contrary, a softening process of the bone. Had the expression of spongifying been kept, and otosclerosis never used, it would have been better, because much confusion would have been avoided.

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

THE SURGERY OF EXTERNAL NASAL DEFORMITIES.*

BY JOSEPH C. BECK, M. D., CHICAGO.

This subject has been and is yet, to a great extent, treated by the general surgeon, notwithstanding the fact that detail intranasal surgery is often necessary to obtain the best results. Again, a large majority of external nasal deformities are treated by charlatans because general surgeons, as well as rhinologists, often refuse and discourage treatment of the above named conditions for cosmetic purposes. This fact, I believe, is responsible for many bad results, accidents, and malformations, rather than improvements. Many such patients belong to the care of a neurologist, and should receive the strictest attention, and by all means prevent them from falling into the hands of an unskilled so-called specialist or beauty-doctor.

The various external nasal deformities that one commonly meets with may be grouped as follows:

1. Those due to marked deflections and irregularities of the septum.
2. Those dependent upon a deformity of the structures of the external nose, as the nasal bones, nasal and alveolar process of the superior maxilla, and the alar cartilages, columna, with the skin covering all the above named structures. This includes the vestibular areas.

Of the first group, one of the most frequent deformities one meets with is the twisted or crooked nose. (Fig. I.) This may

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*Symposium paper presented at the 14th Annual Meeting of the American Laryngological, Rhinological and Otological Society at Pittsburg, May 29, 1908.

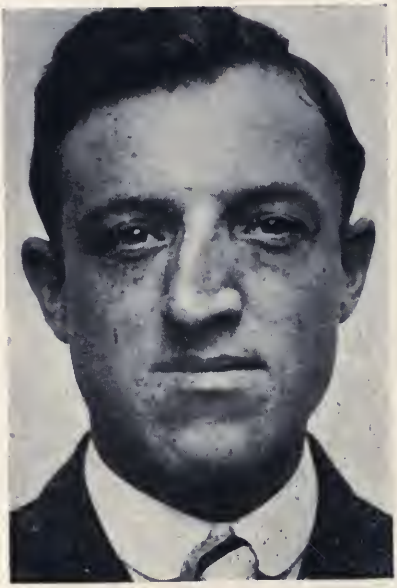

Fig. 1. Twisted or Crooked Nose.

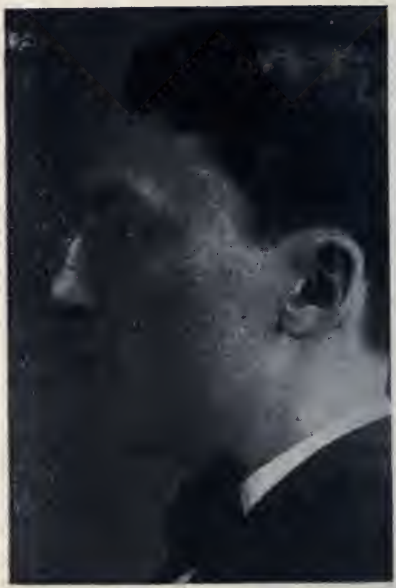

Fig. 2. Notched Nose.

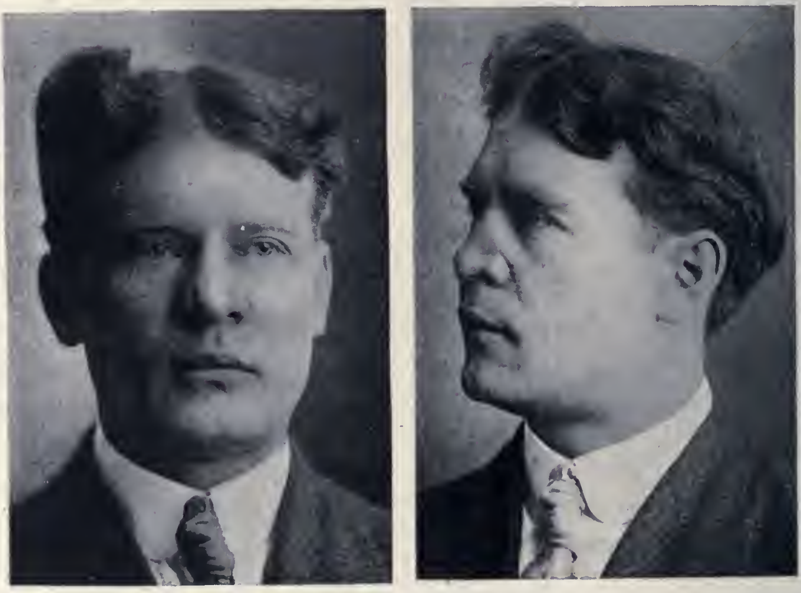

Fig. 3. Squashed or Flat Nose.

vary in degree, and be to either side. As a rule, there is associated with it a hump or more or less prominence; also a dislocation of the anterior triangular cartilage of the septum into one of the nostrils is frequently found.

Another variety of the first group is the notched nose, (Fig. II), that is, the bridge of the nose which is made up by the cartilaginous septum alone, is caved in. This is usually due to some pathological condition, as lues, tuberculosis and pyogenic infection and destruction of the cartilaginous septum, with secondary contraction.

A third variety is the squashed or flattened nose. (Fig. III.) This condition is due to the traumatic severance of the anterior triangular cartilage from the bony septum, or the latter may be also involved in the process. This is frequently found in prize fighters, football players, or in consequence of a heavy fall on the nose.

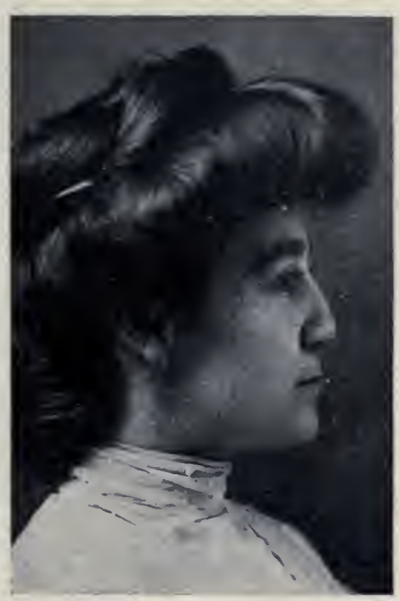

Fig. 4. Congenital Flat Nose.

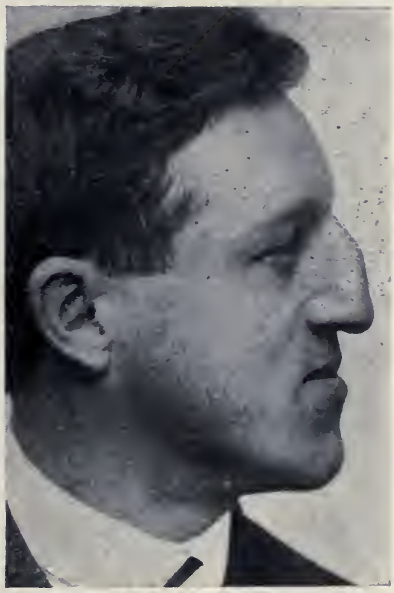

Fig. 5. Large Hump Nose.

A fourth variety, resembling very much the last named one, is that of congenital absence of the maxillary spine and underlying bony tissues of the alveolar process—in other words, the median portion of the premaxillary bones. In consequence of this deficiency, there is a complete lack of resiliency to the tip of the nose, and a distinct folding in or notched appearance at the junction of the nasal frenum and upper lip. (Fig. IV.)

Of the second group, namely, dependent on affection of the external structures, there are very many more varieties and the intranasal structures may be frequently associated in the changed process.

1. The large hump nose (Fig. V.) The nasal bones are massive, curved and large. X-ray pictures show a distinct increase in the thickness of bone. This deformity is characteristic of the Semitic race.

2. The broad bridge or flat nose. (Fig. VI.) In these cases the soft parts, as well as the bony framework, are flattened out. The interior of the nose is usually very roomy and short antero-posteriorly.

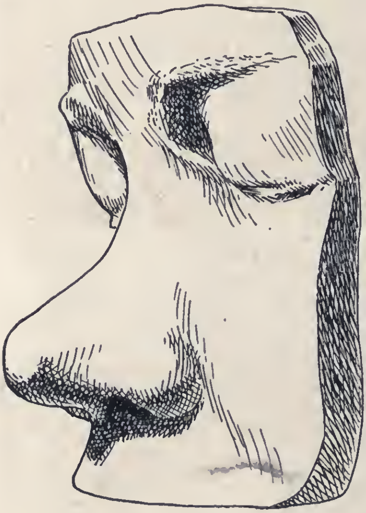

Fig. 6, 7. Saddle Nose.

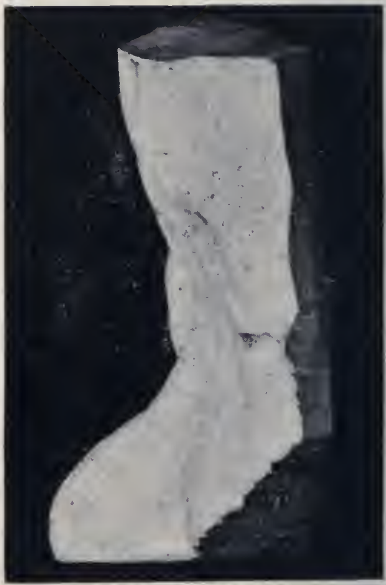

Fig. 8. Saddle Nose Cast.

3. Marked saddle nose (Fig. VII.), not due to any pathological condition. The one characteristic and objectionable thing is the much turned up tip of the nose, and very large anterior external naris.

4. Saddle nose (Fig. VIII.), due to pathological conditions, particularly in the late stages of lues, or in congenital lues. These cases are associated with, or follow closely upon, severe intranasal ulcerative processes, with necrosis of the septum, nasal bones, lateral wall of the nose. Very frequently the hard palate or floor of the

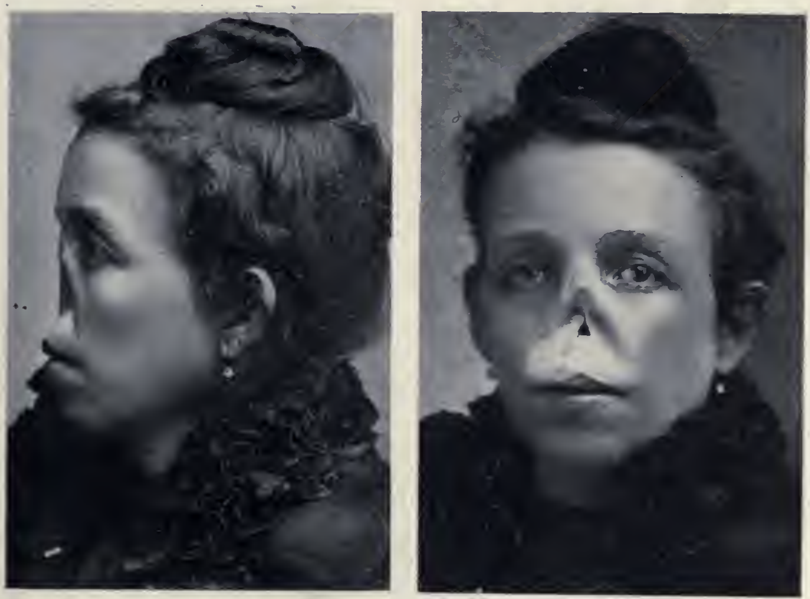

Fig. 9. Pushed in Nose.

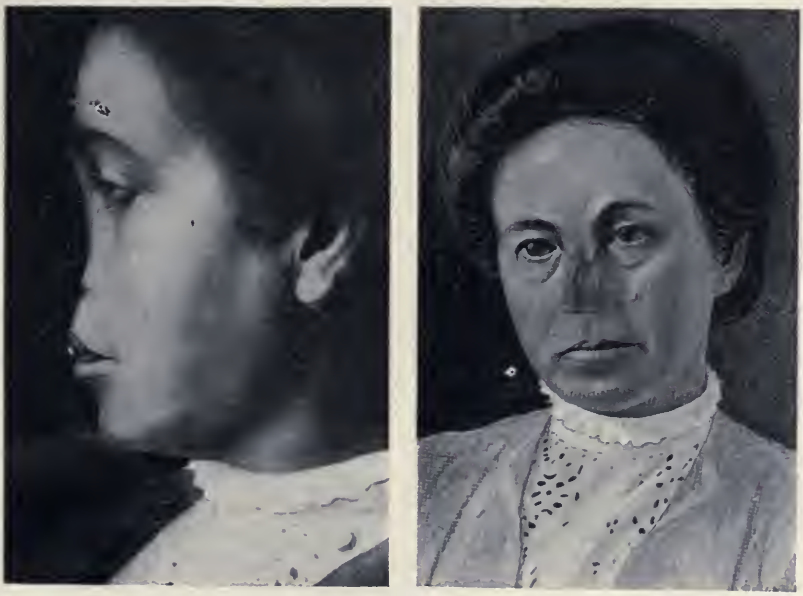

Fig. 10. Pushed in Nose.

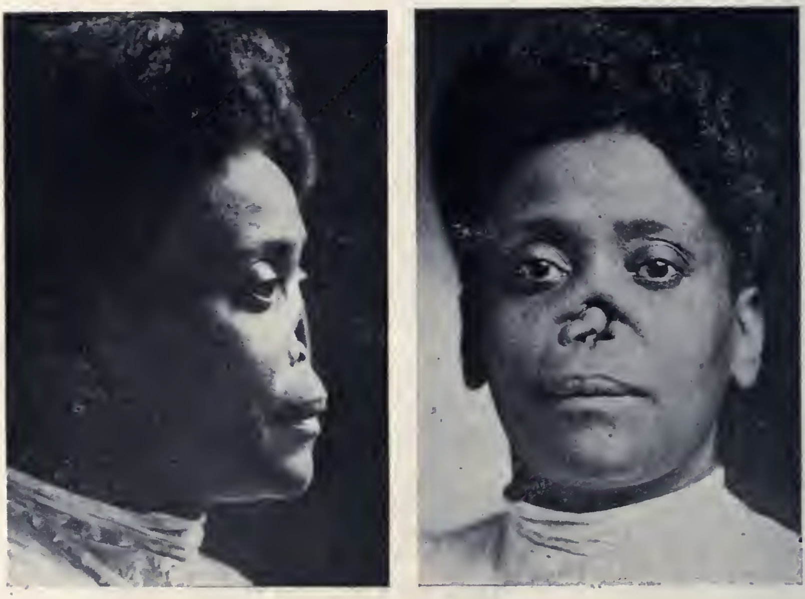

Fig. 11. Pushed-in Nose.

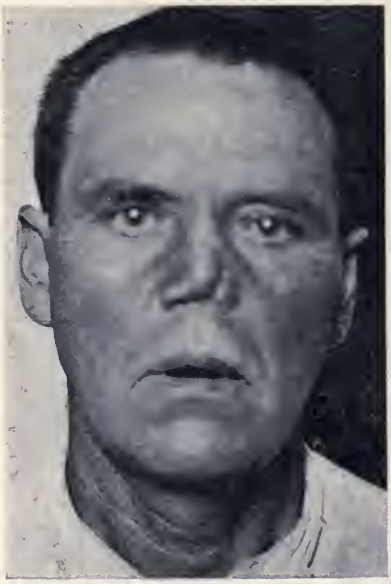

Fig. 12. Unilateral Deformity.

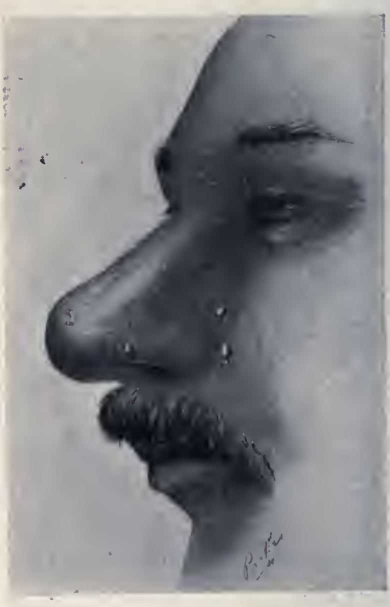

Fig. 14. Pound Nose.

nose is simultaneously affected, and a sequestration with a perforation follows. The soft parts of the external nose may also be attacked and destroyed. The ultimate result of this marked pathological process is cicatricial contraction, which finally causes the great deformities.

5. The so-called pushed-in nose. (Figs. IX, X, XI.) This is seen in cases where the nasal bones are not collapsed, but simply all the soft parts are affected, including all or most of the septum. Some of the cases have the skin drawn tightly across the former tip of the nose, that is, from one fossa pyriforma to the opposite. In some it is exulcerative, and the nasal mucous membrane is constantly exposed. In some the skin is drawn away in and up, making a large cavity where the protruding nose was formerly situated.

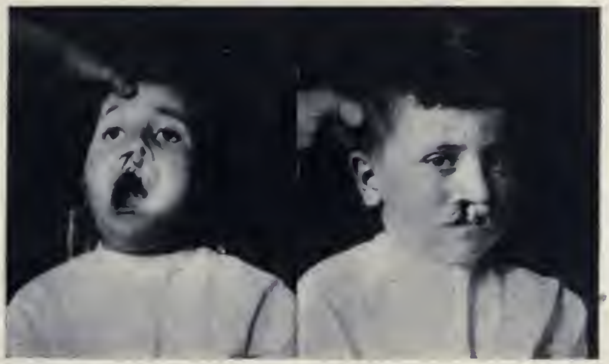

Fig. 13. Hare-Lip Nose.

The anterior nares are usually represented as two small irregular openings. The cause of such an affection is late syphilis, although lupus, rhinoscleroma and tuberculosis can cause the same trouble. A very infectious process (furuncle) has been followed by the above named deformity.

6. Traumatic destructions and irregular deformities cannot be described, except each case by itself. It may take on any of the forms or appearances mentioned, or a combination of them.

7. Unilateral deformity (Fig. XII.) usually right, through the alar region, is frequently seen in consequence of tuberculosis, although leutic cases of that kind are quite frequent in the literature.

8. Hare-lip nose. (Fig. XIII.) This may be unilateral or bilateral. It may be a large gap right through into the nasal cavity, or it may have been already repaired. While it may have been the best

result the surgeon could obtain when he repaired the hare-lip, still the nose does not look absolutely normal. Usually the alae are not properly fixed, and in consequence the nostrils look broad and out of shape.

9. The pinched nose. In cases of healed-out lupus, especially of the tip and vestibule, cicatrices form in such a case as though the tip of the nose was being constantly pinched. It looks very small and out of proportion to the rest of the nose.

10. The pound nose (Fig. XIV.) (Pfund Nase). This is the large bulbous end of the nose in acne rosacea. These vary in size and degree. Small and large excrescences stud the whole surface of the nose and the neighboring portions of the face are spotted and eczematous. Cases are on record, (the author has seen one), where the pediculated tumor springing from the nose was as large as a small apple hanging by the pedicle. This is a true pathological condition of an atheromatous character, and is found most frequently in drinkers of alcoholics.

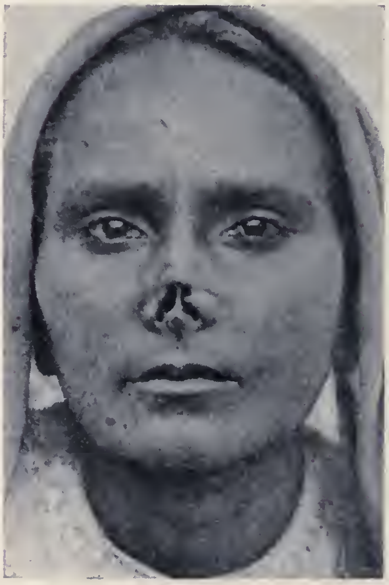

Fig. 15. Hacked Off Nose.

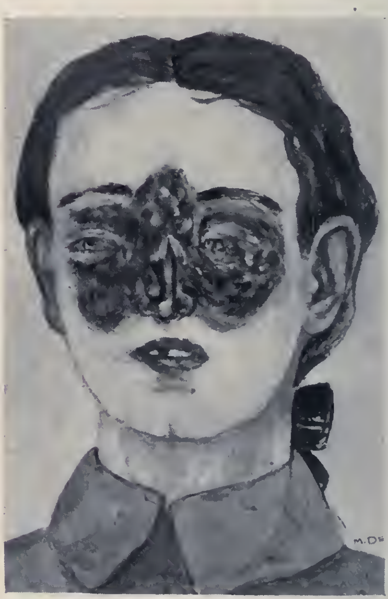

Fig. 16. Exulcerated Nose and Face.

11. Hacked off nose. (Fig. XV.) A deformity very rarely seen in this country, but a common condition among the women in the orient, where punishment is dealt out in such a manner as to cut off the soft portions, including cartilages of the noses, and leav-

ing it to heal by granulations. In sword duels and in war times, this accident has occurred. Accidentally this condition has occurred, as a plate of glass, etc., may cut off the whole, or a portion of the nose. The author knows a few cases where the latter accident has happened.

12. Exulcerated Nose and Face. (Fig. XVI.)

These are usually luetic patients, and especially in children (congenital). The process takes on the form of a granuloma, and is often mistaken for a tubercular process. The skin covering the nose, cheeks, eyelids and forehead, as also the upper lip, exulcerates; the cartilaginous portion of the external nose is fairly well preserved. In some cases bony destruction also accompanies the process. Cicatrization is very slow, and a more unsightly picture cannot be imagined, with the nasal secretion constantly bathing the face.

These illustrations of deformities are the cases out of my practice or referred to me by other physicians, and some will be shown later corrected.

I have purposely used very commonplace terms in classifying these deformities, because they are most frequently so spoken of.

Plastic surgery principles, especially when flaps are used:

1. Proper measurements of the flaps must be made as to their shapes and sizes so as to cover the defect.

2. Always allow for shrinkage of flaps.

3. Do not make the flaps too thin and jeopardize their life. When pedicles are used, see that they are not too narrow, so that plenty of blood supply enters the flaps.

4. Do not twist the pedicle too acutely and thereby strangulate the flap.

5. Thoroughly freshen surfaces of the defective area and undermine the edges properly so as to insure good union of the flaps.

6. Never use much tension on the flaps, and a counter incision in the vicinity may be necessary to relieve tension.

7. Perfect adaptation of the wound edges is imperative, and exact suturing is desirable; at the same time, do not place the sutures too close to one another, because death of the edges may take place from strangulation.

8. The finest of needles and suture material should be used. Horsehair makes excellent material. Handle the flap with great care by not using too large a rat-tooth forceps.

9. If, in the next day or two, the flap looks anemic and edematous or blue and blistered, one may have to relieve some sutures and apply warm compresses. A few small punctures with the knife in the edematous skin is at times of value.

10. Time is an important element in these operations, in that it requires a great deal of it. Do not work fast.

The indications for the correction of external nasal deformities are:

1. To establish a proper respiratory organ and correct all the pathological conditions dependent upon the imperfect ventilation and drainage. These are the cases that obstruct the anterior naris principally.

2. Cosmetic purposes. Two distinct indications may be mentioned here, namely, (a) where the deformity is of such a type as to prevent the individual from being permitted to associate with other people, owing to the obnoxious appearance, of being denied the same privileges as others, and of finding a suitable occupation. For example, I know an excellent mechanic who could not find employment, owing to his external nasal deformity. The other workers in the shop refused to work beside him or to handle any of his work. Many of these individuals will hide and veil their faces—in fact, many will remain in seclusion constantly rather than be subjects of curiosity and comment. (b) The second indication for cosmetic purposes is by far the larger number. I had intended to place this group of cases as contraindications at first, but reconsidered the matter in order to establish a point for discussion as to the limitation of correcting these deformities. I allude to the individual who does not like the shape of his nose. It is either too long or too short, flat or humped, crooked and twisted. The point is too long, broad, thick, flat, curved too much, or turned up too far. There may be a slight irregularity over the bridge of the nose or a slight depression. In fact, a number of deformities may present themselves. These are the cases which present themselves by the hundreds to the beauty doctors, and, as a rule, are spurned and discouraged by physicians. Those of you who have seen some of these cases after they were corrected by these so-called specialists, wonder if you have not acted unwisely by refusing to listen to these unfortunate individuals. I am inclined to believe that there is a slight mental unbalance, referable especially to this subject of their nasal deformities, and I am sure that every one has seen morose and melancholy individuals who were conscious

of the fact that they have slightly deformed noses. The indication in these cases is possibly to refer them to a neurologist; but his counsel and treatment will not cure them. Now, since these cases occur principally among the better class of people, if one is convinced that they will carry out their way of having a slight deformity corrected, if the patient is not willing to listen to reason and leave the matter alone, may not the indication be present for us to correct these deformities, rather than permit these patients to drift into unskilled hands, especially into the hands of those who are not well versed in surgical principles, for oftentimes such patients may be fleeced out of large sums of money. It must not be forgotten that most of these individuals are never absolutely pleased and satisfied with their results, and from this standpoint I find they had better be left alone. There is, however, a suggestion to offer, and that is to have, before operation, a signed agreement that the patient assumes all the consequences so far as the cosmetic effect is concerned.

Again, I wish to be distinctly understood that I am making this indication for the purpose of discussion only, for I have heretofore always refused to correct these deformities, and will continue to do so, unless my point is well taken.

In order to correct an external nasal deformity, one should have a pretty good idea as to what shape the nose should have after correction. This is important in association with the rest of the facial and body expressions. The best guide is naturally a picture or cast of the nose previous to its deformity. However, this is not always obtainable, and one should have a good idea of the conformation of facial expression and lines. I have made a close and careful study of this subject and find that Vanderpoel's text-book is the best suited to attain this.

The majority of the results obtainable in grave external nasal deformities, where plastic surgery was necessary, and especially in the transplantation of flaps, are anything but perfect—in fact, most of the noses that I have seen following these results are ugly. At the same time, the improvement, considering the original, especially in those cases where ulcerative processes and exposure of the nasal mucous membrane are present, is so marked as to have the gratitude of these patients without comparison. Right here, I want to say that that is principally all you do get—a great deal of work and appreciation. I mean to say that most of these cases occur among the poor. It is the persistence of labor that finally brings results, and one must never feel discouraged when, for example, he has made a fine flap and all looks well right after the operation, when he finds a few days later that the whole flap has sloughed, and the work has to be done over again. It is not rare to have ten or fifteen sittings before a plastic operation on the nose is completed.

METHODS.

The various methods of correcting external nasal deformities are principally two, namely, (1) intranasally, or intravestibularly; (2) externally.

Since the other gentlemen in this symposium are going to treat the subjects of intra-nasal methods of correcting nasal deformities as well as paraffin methods, I shall omit that portion of nasal plastic, except referring to it incidentally, and show some results following that method of procedure. The principal methods in vogue for external corrections are:

1. Indian methods,
2. Italian methods,
3. German or French methods,
4. Miscellaneous methods.

The Indian method purposes to replace the defective or absent portion of the nose by using a pediculated flap consisting either of skin and subcutaneous tissue from the forehead, or it may contain the periosteum and external table of the frontal bone. Figs. XVII and XVIII show such a method in a case of marked traumatic destruction of the nasal bones and loss of skin. The flap, with its pedicle severed after ten days, is seen, as is also the bone-periosteal skin defect. This latter is covered with a skin graft. When bone is not removed, or when the skin is very loose, the defect may be covered primarily by bringing the skin into approximation, as will be shown by Case I.

The Italian method purposes to replace the defect or absent nose by using skin flaps from the arm or forearm. Figs. XIX and XX show a young man who had a marked ulceration destruction of his nose and lip, following congenital lues. His left arm was prepared, and a large pediculated flap was made, consisting of skin and much subcutaneous connective tissue to give the flap considerable body and nourishment. It is sutured on a previously prepared surface on more than half of the nose. The arm is fixed and immobilized by plaster cast, and kept in that position for about ten days, during which time the wound can be observed and dressed. After that period the pedicle is detached from the arm and allowed to remain for a day or two, so that it should shrink and get firmer before it is sutured and conformed to make the nose. This picture shows well the two principal steps in the procedure.

The German or French methods purpose to cover the defect or replace the absent nose by obtaining flaps from the cheeks and other neighboring portions of the face. This method is particularly adopted for small unilateral defects, or the formation of a columna from the upper lip. The formation of the alae is a very neat procedure from the cheeks. However, for large defects or complete absence of the nose these methods are not followed by good results.

Under the head of miscellaneous methods may be mentioned the use of the finger, which is implanted and held in position by holding the arm for a week or two in a plaster cast, then amputate at the second joint, or even at the metacarpophalangeal articulation, and thus obtain a firm septum and skin cover. This method is not greatly favored.

The introduction of bone or other foreign substances, as gold, silver, hard rubber, etc., in saddle noses, as well as the exsection of bone in hump noses, will be described in connection with cases, as will also other methods of procedure.

Since there are many varieties of external nasal deformities, and each case is a law to itself, there are naturally many forms of operations devised, consequently, I shall take up the principal deformities in presenting cases very briefly, and describe the method of operating, incidentally mentioning other methods.

Case I. Miss W., 30 years old, had lues when 20 years of age, which was not diagnosed and treated for four years. Finally there was complete loss of the nasal septum, all turbinals on both sides, and some of the lateral wall of the nose. There was a large perforation of the hard and soft palate about the size of a dollar. The uvula was lost by an ulcerative process. The external soft parts of the nose, including most of the cartilaginous alae, were destroyed and replaced by a tightly drawn scar, leaving a small single opening in the place of the nostrils. Patient had a very thorough antispecific treatment, and was generally absolutely well.

With the above history she was referred to me by Dr. Brophy. Examination revealed a healthy looking mucous membrane of the nose (examined through perforation) and throat.

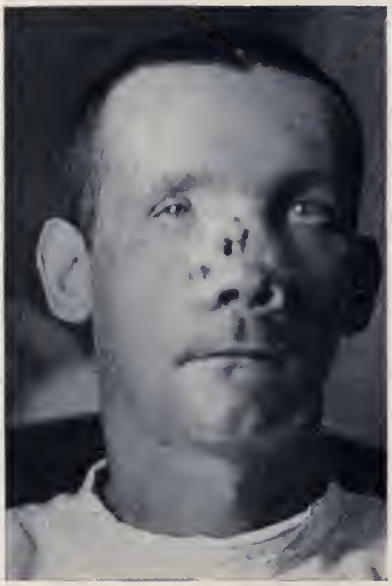

Fig. 17.

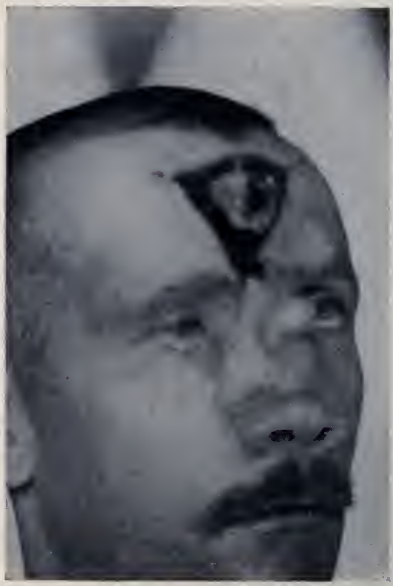

Fig. 18.

Demonstration of the Indian Method.

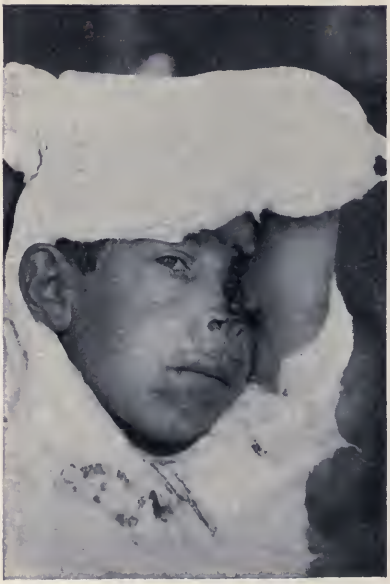

Fig. 19.

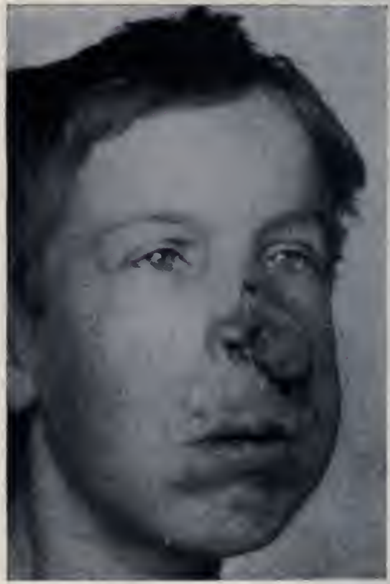

Fig. 20.

Italian Method.

Fig. X shows her appearance at this time. The first procedure was to resect the scar and find the small remains of the cartilages of the alae. Then a columna was made out of the upper lip. I then made two flaps, one from each cheek (German or French method) suturing these different parts together, so as to make a fairly good looking nose at the time of operation, and expecting to place within the nose some mechanical support, instead of the septum, attached to a dental rubber plate, which the patient was wearing to phonate properly, when healing took place. In the meantime, two small rubber tubes were inserted, one in each nostril, and a gauze pack to support this new formed nose. The healing was prompt and the contrivance attached to the rubber plate was introduced on the tenth day. All looked fairly well for about a month, when the flaps began to shrink, and very soon the nose looked about the same as before the operation. About three months later I used the right arm (Italian method) to obtain a large flap. The arm was thoroughly prepared and a large flap (making allowance for retraction) was made; the above retracted skin of the nose was resected and made good, substantial, freshened surfaces. We then approximated the arm and sutured most of the flap. Bringing the forearm over the head, we fixed it by

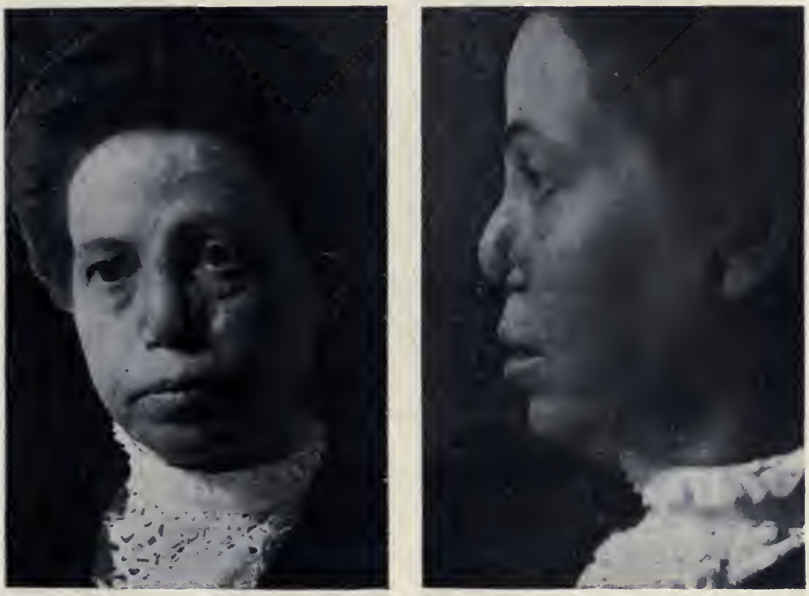

Fig. 21.

means of a plaster cast so as to immobilize the whole arm. This operation was done in the summer months, and the patient suffered a great deal of inconvenience. Only a portion of the flap remained united, and made it impossible for me to complete the operation when the arm was released. In the fall of the same year I used the left arm in the same manner with very poor results. In the winter of that year I decided to use a flap (Indian method) from the forehead. This was implanted into a previously prepared defect. It healed by primary union. On the tenth day the stitches were removed, the pedicle cut loose, and properly implanted. The defect caused by the excision on the forehead was brought together and it, too, healed by primary union, although considerable tension was necessary to approximate the edges. It further required about half a dozen small operations, for instance, making a new columna bringing the alae out, so as to make good-sized nostrils. We injected paraffin below the flap to give it consistence for a tip of the nose. The end result is shown in Fig. XXI.

Case II. Mrs. E., aged 43. Has practically the same history of lues which was not diagnosed and treated for several years. The end result was complete destruction of the soft palate. The whole external nose was destroyed—that is, the cartilaginous portions, and the upper lip has multiple scars which radiate to the cheeks. Fig. IX shows the patient at her presentation. This woman was absolutely dependent on her own resources and had to work. She was a fine seamstress, but could not get employment owing to her appearance. She preferred not to be operated on, if it was possible to correct the deformity without operation. Considering the situation, the fact that her general health was not very good, and the multiple hard scars that were present, I decided to use an artificial nose, (Fig. XXII), which was very satisfactory to the patient. Fig. XXIII shows the patient after the appliance is properly adjusted. This artificial nose was made by Hofman of Chicago, of flesh-colored celluloid, held by a celluloid spring and the nose-piece of her spectacles. Unless one looks at her very closely, it is not possible to discover this prosthesis, and some advise the use of actor's paste to do away with the junction of the nose with the cheek. I believe in similar cases this method of correction is preferable.

Case III. Miss M., 13 years old. Congenital lues, with marked destruction of the septum and lateral wall of the nose. End result a very marked saddle nose with the skin from the bridge of

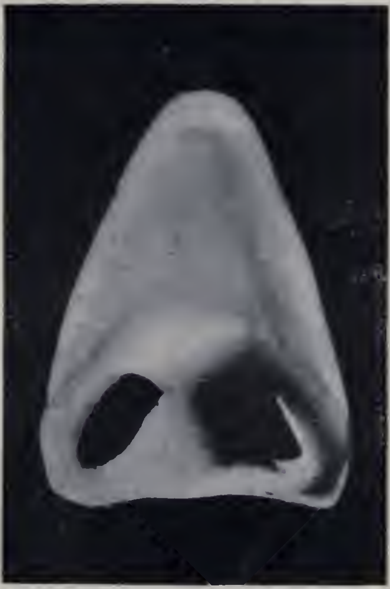

Fig. 22.

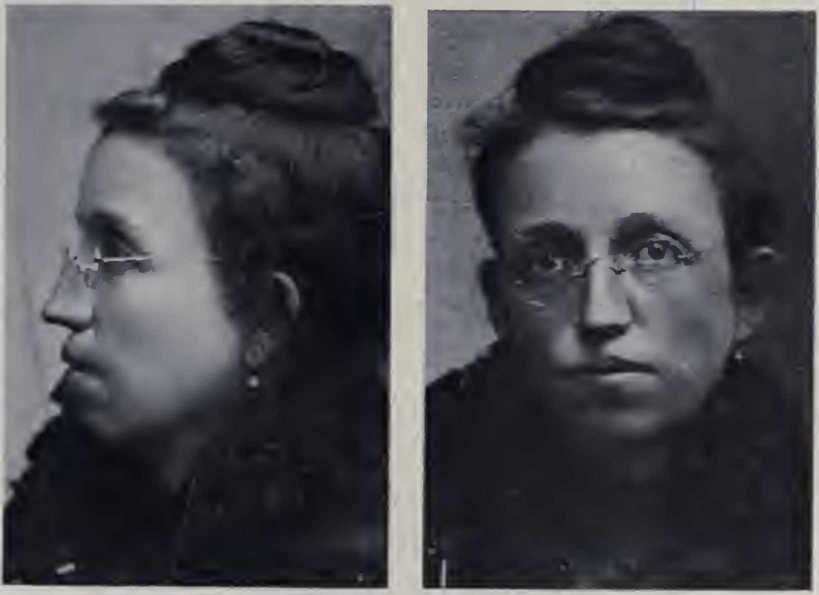

Fig. 23.

the nose folding over the inner canthus of the eyes and causing trouble with the tear duct. (Fig. VIII.)

That it was not the nasal canal that was causing the epiphora was later proven by the cure, which was accomplished by injecting paraffin. The method of procedure in correcting saddle noses or notches by means of paraffin is so well known that I do not think it is necessary to go into details. Hard paraffin is used, injected in semi-solid form by means of the author's syringe. (Fig. XXIV.) The entire saddle-shaped deformity is filled out at once and rapidly formed into a suitable bridge. Ice is applied immediately over the injected area. Secondary correction by reinjection is sometimes necessary. Too great a quantity may be injected, thereby causing a worse deformity than before, or if one is not careful, it may be injected and allowed to spread in a wrong direction. Again, from too great a quantity necrosis of the skin may result. Infection, hematoma, hemorrhage and embolism belong to the rarest complications. Injections in series of several sittings are followed by a lumpy correction. By observing the proper technic laid down, namely, perfect asepsis, perfect instrumentation, assistant to prevent spreading in a wrong direction by compressing the skin at the side and upper limit of the bridge of the nose against the underlying bone, avoiding the entrance of the needle into a large artery or vein, usually injecting near the middle line, and inserting the needle separately from the syringe, if no bleeding occurs through the needle, the complications of hematoma, hemorrhage and embolism will be avoided.

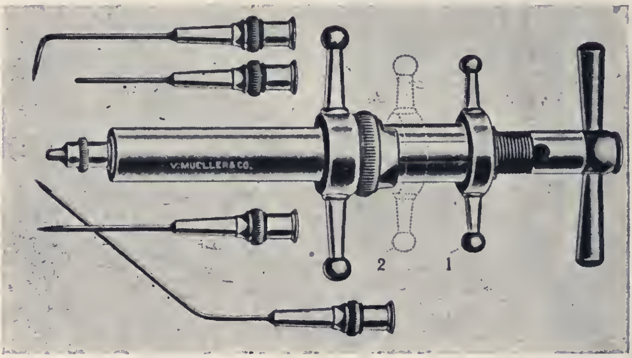

Fig 24.

Good judgment is the only criterion against injecting too much paraffin, and if one should do so rather than through a small incision, one can remove parts of paraffin for some time after operation without any evidence of scars. A mistake made sometimes is to inject the paraffin into the skin proper, rather than below it, which invariably is followed by death of the epidermis. If one wishes to inject in series, then he had better use the method devised by Onodi and others, using semi-solid paraffin that can be moulded. Some interest has been awakened as to the termination of the paraffin, and many experiments have been carried out to determine the same. Kirchner states that soft paraffins are absorbed, but hard paraffins are not. It is stated that new connective tissue forms as a meshwork within the substance of the paraffin. Histological examination makes the bolus appear like a tumor, some say resembling a sarcoma, and it is spoken of as a paraffinoma. The result after the procedure just described above in the present case is shown in Fig. XXV.

Case IV. A young girl, 7 years of age, with a marked ulcerative process of the entire external nose, including the bony framework, eyelids, parts of cheek and upper lip. (Fig. XVI.) The pathological diagnosis was tuberculosis and syphilis. No local or general treatment had any effect whatever. So far as the other parts of the ulcerative areas were concerned, not included in the nose, they were covered by skin grafts and neighboring flaps, and the nose was left to the last. Several methods were used, as described in Case I., including the use of the finger. This method is as follows: Take the middle finger of the left hand, remove the nail and matrix, make an incision into the skin and underlying connective tissue in the middle line along the entire palmar surface, beginning at the tip and carrying it to the phalango-metacarpal joint, dissecting these flaps laterally. Freshen the point of the finger by exposing the bone proper and make a slanting surface which fits later into the region of the root of the nose. We next prepare the nasal field, as mentioned above, also freshen the surfaces along the nasal processes of the superior maxilla. The tip of the finger is then placed into the root of the nose, and there held by suturing first the periosteum, and then the skin to these structures of the forehead. Then the skin flaps are united to the surfaces of the nasal processes of the superior maxilla. The arm is then supported and fixed to the head by a plaster cast. This precise procedure was carried out in this case. After about ten days, during which time the field of operation was daily examined and dressed without the slightest manipulation, it was found united and in good condition. The next step in the operation was to disjoint the finger at the phalango-metacarpal joint, and so shape the finger at this point as to form a good tip of the nose. It was necessary to trim off some bone in order to make nostrils.

This end of the finger is placed into a previously freshened premaxillary area, and there fastened with a wire suture. The remaining skin of the finger is used to best advantage to cover raw surfaces and the formation of alae and nostrils.

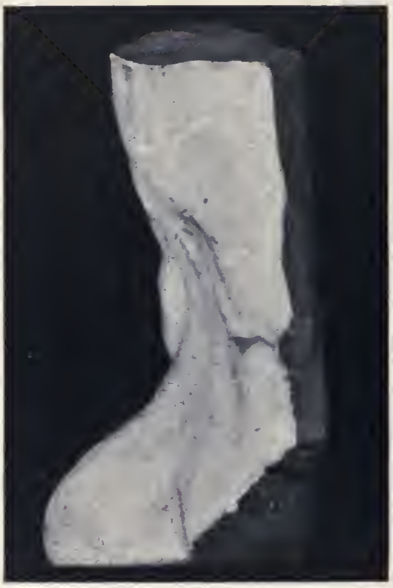

Fig. 8.

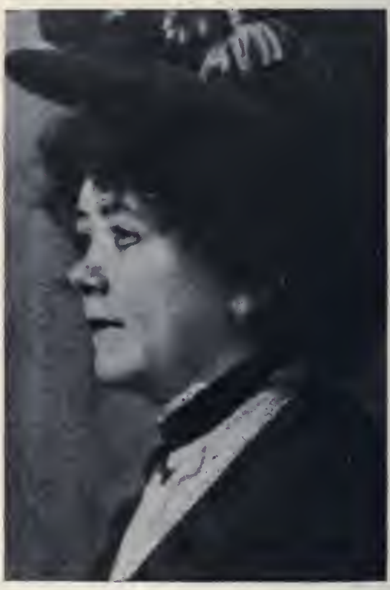

Fig. 25.

This method was also followed by failure, and finally the last attempt was made, which proved to be successful, namely, the Indian method was used in making a flap from the forehead. The case required a great deal of attention and labor. It was practically two years of dressing and treatment, but the result was satisfactory.

I would like to mention one fact in this case, and that is, that this child was kept by its own people in the barn away from the rest of the family. It was the child of ignorant parents who believed themselves cursed, and did not want the neighbors to know anything about its existence. A country physician discovered the case and sent it to Chicago for treatment.

Permit me to mention a similar method used, but which is only applicable when the nose has skin covering it. In those cases the skin is removed from the dorsal surface of finger, the latter is then pushed into the nose, and its tip fastened into the root of the nose. In this way the finger is used as a septum. The palmar skin covered surface acts as though it was covered with mucous membrane of the interior of the nose. (J. M. Finney.)

Case V. Markedly twisted nose to the right, with the anterior triangular cartilage protruding out of the right nostril. Patient complained but little of this nasal obstruction, although he could not breathe freely through either nostril. What he wanted was a straight nose. I informed him that I would remove the obstruction, which would very likely correct most of the deformity, and he readily acceded to the proposition. I resected the anterior dislocated cartilage on the right side, and did a submucous operation from the left, leaving a layer of cartilage at the frenum. I had a most excellent physiological and cosmetic result, as Fig. XXVII shows (casts). Refused publication of photograph.

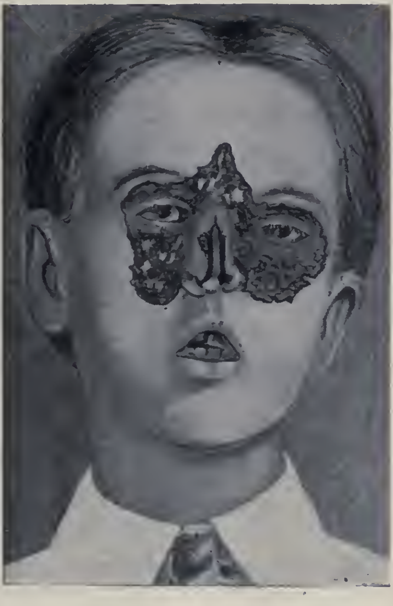

Fig. 16.

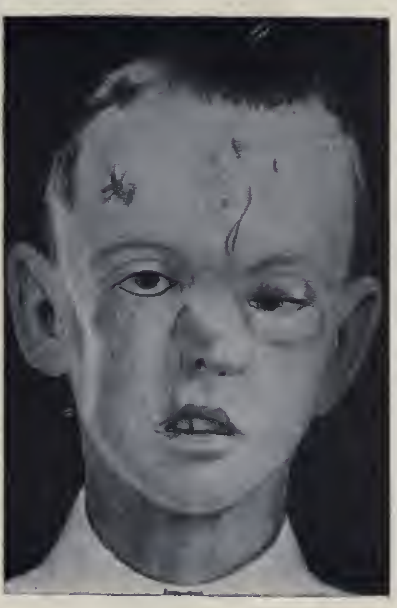

Fig. 26.

Case VI. Miss F., 20 years old. Has a very broad bridge of nose, and a markedly deviated septum. While a small child, sitting on a high chair her father, while intoxicated, pushed her head against the edge of the table, fractured and pushed her nasal bones inward. (Fig. VII.) Operation. I made an incision within the alae on each side, so as to reach the free border of the nasal bones, then bluntly dissected below the skin as far as the root of the nose. Next I introduced a pair of Adams' modified osteoclastic forceps and broke the nasal bone union in the middle line in such a way as to form a sharp edge over the bridge. Then I drilled a hole externally through the nasal bones and passed a 3-inch silver peg. I covered the bridge of the nose with a layer of gauze, so as to avoid pressure necrosis from the now applied silver wire in the shape of a figure eight loop from one protruding point of the peg to the other. This peg and wire procedure prevents the collapse of the nose. In addition, two Frankel's semi-solid splints were introduced along the side of the septum to support the nasal bones from within. Small drainage silkworm strands are introduced into the alar incisions. The case made an uneventful recovery, with the exception of considerable reaction which, however, cleared up. The pegs were removed on the fifth day, and the openings were the only points of infection. Fig. XXVIII. shows you the final result. (Patient refused to have picture taken.)

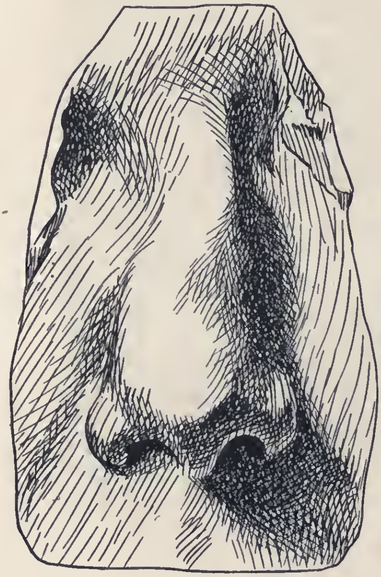

Fig. 27. Cast Before Operation.

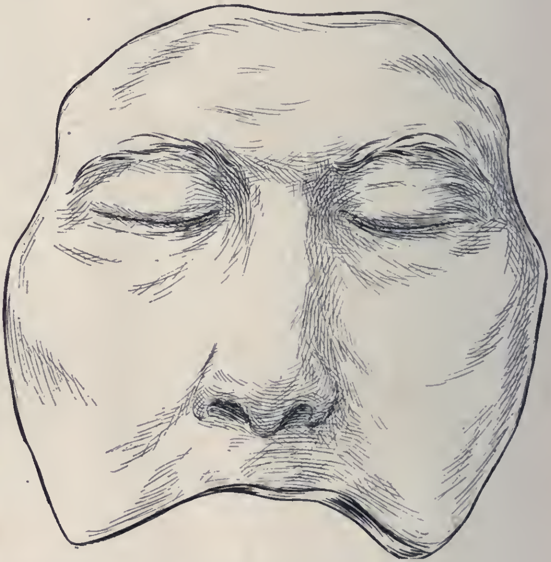

Fig. 27. Cast After Operation.

Other methods for correcting such a deformity in vogue are to make a longitudinal incision along the bridge of the nose, incising the periosteum and peeling back. Then over a properly prepared anterior tibial surface an incision is made, and the sharp edge of the anterior border of the tibia is chiseled off and shaped; the periosteum is to remain attached to the bone splinter to insure its life. The nasal bones are then scraped, or a bur may be used and the bone splinter introduced. The nasal periosteum is then drawn well over it and sutured with catgut. The skin is then sutured carefully, using various methods. The Halstead subdermal suture makes a good one, as there are no stitch holes possible. Dr. Carl Beck of Chicago suggests making a skin graft flap before incising the skin, which, when the operation is completed, serves to cover up the cut.

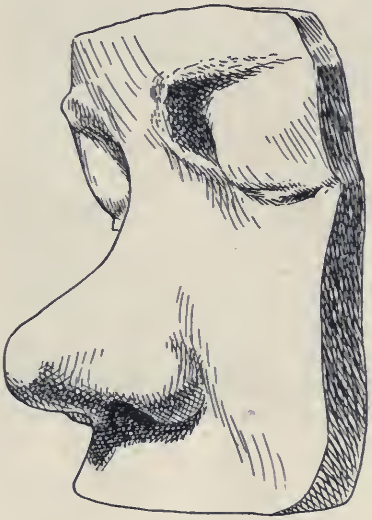

Fig. 28.

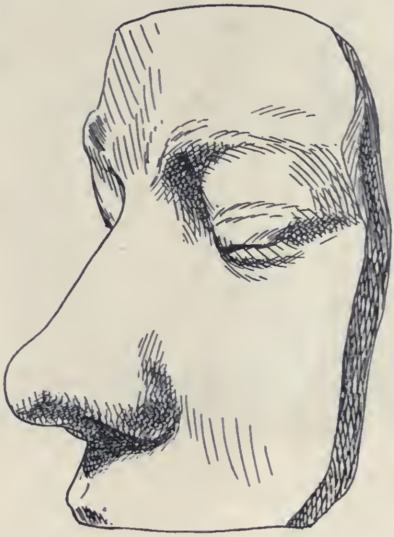

Fig. 7.

Another method is to introduce foreign substances, like aluminum, silver, platinum, and gold plates, but all these methods are losing favor. Of course, paraffin injections are very serviceable in these cases.

Case VII. Mr. H. Large hump nose. Operation was done purely to correct the deformity for cosmetic purposes. His deformity caused his hypersensitiveness to grow to a degree of melancholia. He shunned society—in fact, he did not feel like going to work. He is a salesman by occupation.

Operation. A transverse semilunar incision, with the convexity upwards, was made, beginning at the nasal process of the superior maxilla on one side, and carried to a corresponding point on the opposite side. The skin and periosteum were peeled down as far as possible to the lower limit of the hump. By means of Killian's wedge-shaped chisel the hump was removed, great care being taken not to open through the mucous membrane into the nasal cavity. In spite of care, it occurred in two places. The periosteum was drawn over and sutured carefully, as was the skin. Patient made an uneventful recovery. No drainage was used. An attempt was made to bring the bones together after the hump was excised, but it was impossible.

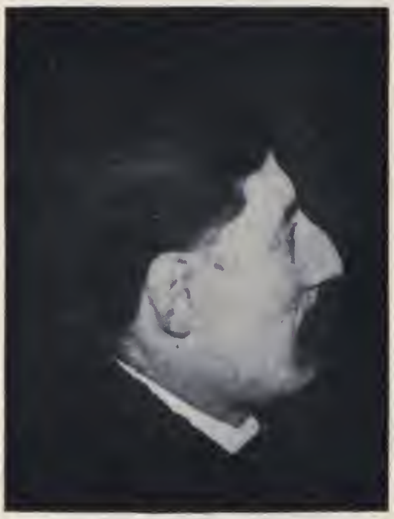

Fig. 29.

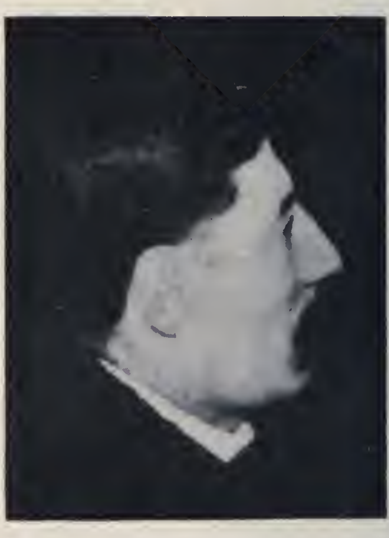

Fig. 30.

The incision is, at times, made longitudinally along the ridge, with equally good results. Of course the incision I made is practically hidden by the nose piece of the spectacles. Intranasal methods are at times used to correct this deformity.

Case VIII. Miss I. Congenital absence of premaxillary bony ridge, with the characteristic flat tip of nose. (Fig. IV.) Purely for cosmetic purposes, the patient presented herself for operation.

Operation. An intranasal incision was made at the floor of the nose, beginning at the entrance of the nose, and carried about one and one-half inches backward. Blunt dissection was made of the muco-perichondrium and osteum, chiseled off a spiculum of bone from the floor of the nose; made a pocket below the columna loosening its attachment to the premaxilla, turned this bone spiculum into this pocket; brought back the muco-perichondrial flaps, and held them with packing. On the third day I removed the packing. Healing took place, and considerable improvement followed. Fig. XXXI. shows the condition after operation, and some subsequent paraffin injection.

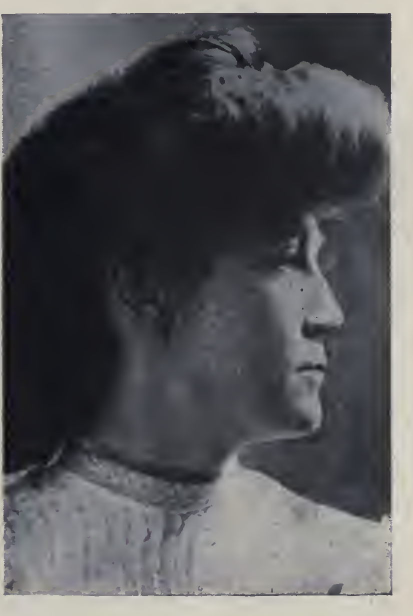

Fig. 31.

Case IX. Mrs. X., colored; about 45 years ago she had some trouble in her nose, which was followed by a caving in of the whole tip, especially the left side, and finally it grew fast in that shape. There is no history of syphilis obtainable, and the woman has three healthy children. Examination reveals a complete destruction of the cartilaginous and bony septum, but the nasal bones and lateral margins of the bony nasal framework are intact. The cartilaginous alae are preserved, however drawn inwards, especially the left side, and firmly held, with the skin of the tip of the nose which is intact, to the floor of the nose. The nasal frenum or columna is also preserved. Fig. XI shows the condition as above described.

OPERATION.

Under general anesthesia by the spray-vapor method. I mention this especially because it was the most satisfactory narcosis I had ever given for a similar operation. The following steps were performed: Packed nose. Severed the adhesions of the drawn-in nose to the floor; thoroughly severing all attachments to the lateral margins of the bony framework, as well as the free borders of the nasal bones, as far up as the root of the nose. All these procedures were made within the nose, no incision being made externally. This permitted drawing out the whole tip prominently. I now scraped very thoroughly the nasal bones, just below the skin, and also the floor of the nose right behind the columna. This was done in order to obtain fresh bone surfaces for the implanted bone septum. Packing the nose, I next made an incision over the previously prepared anterior border of the right tibia for about four inches up to the periosteum. A two and one-half inch piece of bone was now excised with the periosteum attached, using the sharp ridge of the tibia as the future nasal septum. The shape of this splinter was triangular, with the base downward, to be implanted at the floor of the nose and the apex on top of the nasal bone. The periosteum of this splinter was now in contact with the subcutaneous connective tissue of the bridge of the nose. A suture was now passed through the periosteum of the splinter, right back of the column of the nasi, and allowed to come out below each nostril through the upper lip, and close to the frenum, a pad of gauze was placed externally over the frenum and the suture tied. This was done to hold the splinter in position to give prominence to the tip of the nose, the gauze packing is now completely removed, and two large Asch tubes are introduced, these being held from falling back into the nasal cavity by two threads fastened by adhesive plaster to the cheeks. No dressing was applied. The patient recovered from the operation, and Fig. XXXII shows her after operation.

Case X. Mr. S., (Fig. XIV.), mild form of pound nose, acne rosacea. There is a general overgrowth of the soft parts of the external nose. A number of studded areas are present. with a central breaking down. The skin is generally eczematous and deeply red. Distinct large venules are to be seen everywhere over the nose. This process extends to the forehead and side of cheeks, The man is not a marked drinker, and the withholding of liquor has had no effect on it. The treatment in this case is very satisfactory by means of the high frequency currents and electrolysis. After a few sittings the nose became paler and smaller, as shown in Fig. XXXIII.

Other methods of treatment in these cases have been to use electrolysis, electric needle punctures (galvanic current), electrocautery, severing the small blood vessels surgically, multiple incision, and the operation of decortication and skin grafting. This last procedure is only warranted in very marked cases. It simply means to remove all the pathological tissues and cover with skin graft.

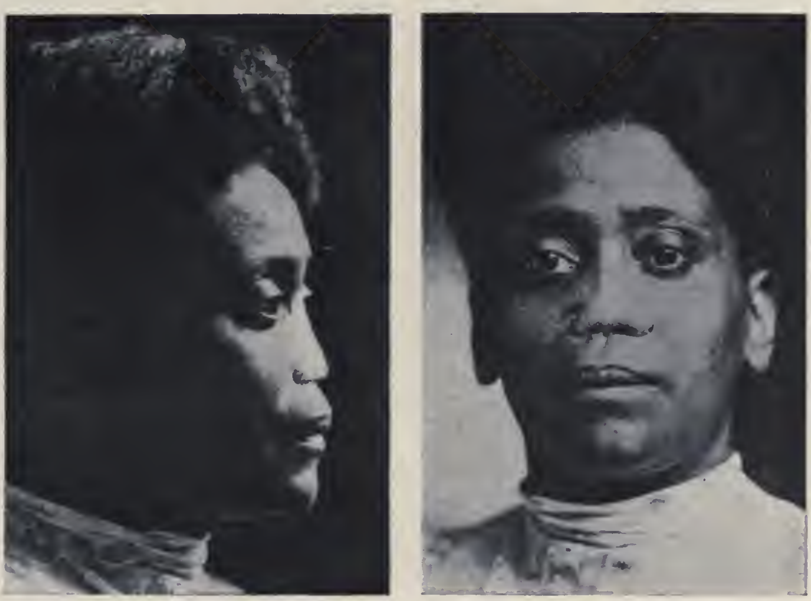

Fig. 32.

Case XI. Baby M., 1½ years old. Had an operation for harelip shortly after birth. The result was very satisfactory, but the nostril was not perfect. Its greater diameter was transversely rather than antero-posteriorly.

Operation. This consisted in freeing the ala from the cheek and drawing it closer to the columna, so as to conform to the shape of the opposite nostril. Then the cheek was slightly loosened from its attachment at the fossa pyriforma and drawn over to the new fixed alae in its new position and sutured. Healing by primary union occurred, and the result was good. A small Asch tube was worn in the nose for a few weeks, three hours daily, in order to obtain and preserve the proper shape of nostril. In double-sided hare-lips a similar procedure may be necessary. No photograph obtainable.

Cases XII and XIII. Both these cases have practically the same form of deformity, and the same method of procedure was used, so I will consider them together.

Mr. W., medical student, has been suffering from chronic nasal obstruction, which was due to a markedly deflected septum. This was operated upon by the submucous method. An unusual and disagreeable complication resulted, namely, a constant bleeding. Patient was sent to a hospital, where inexperienced men in this line of work attempted to control this bleeding, the patient's own physician (a specialist) being out of the city at the time. According to the statement of the student, the internes used all sorts of remedies by spray, swab and pack, as $H_2 O_2$, adrenalin, ichthyol and iron, without controlling the bleeding. I saw the patient one week after operation, and there was still bleeding from within the flaps. The operation was perfect, but the flaps were not coapted, and a big hematoma was situated between them. I removed this, coapted the flaps, and kept in this position by firm packing in both nostrils. Hemorrhage ceased, and on the third day the packing was removed. There was no more bleeding, but after that the nose was stuffy for some time, but finally cleared up and good breathing

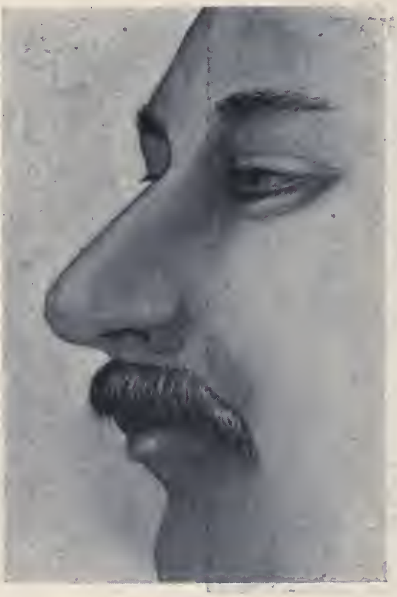

Fig. 33.

space was obtained. Six weeks later the patient came back with a sunken-in nose, as shown in Fig. II, the notched nose. This notch is situated just below the free border of the nasal bone, and more on the left than on the right side.

Operation consisted in injecting a small amount of hard paraffin, subcutaneously, to fill out the notch, with a good result.

M. H., 7 years old, received a blow from another boy on his nose, and his nose swelled inside, so that he could not breathe through it for about a week. Then his mother noticed a discharge from his nose, and he was well again.

Three weeks later she noticed suddenly a notch in his nose, between the tip and the hard portion.

The diagnosis was probable abscess of the septum, following traumatic chondritis. There was secondary wasting of the cartilage, with contraction of the cicatricial tissue, and sinking in of the septum. Hard paraffin was injected with satisfactory results.

So far as the numerous external nasal deformities, such as moles, blemishes, wrinkles, scars, and the various insignificant and often imaginary troubles are concerned, I have nothing to say at present, because I have already expressed myself in the first part of my paper. Tumors and other pathological conditions not mentioned in the article will be dealt with by the usual surgical principles and cosmetic surgery.

As to the literature on the subject, it is very exhaustive, and to repeat it would add little value to this article. But I want to mention and to present here a little original book of Tribhovandas Motichaud Shah L. M., assistant surgeon and chief medical officer of Junagadh, presented to Dr. Carl Beck. In it are detailed descriptions of 100 rhino-plastic operations performed by himself. Two principal methods were used, namely, flaps from cheeks and forehead were used. The latter gave the best results.

A more modern reference is the one of Dr. John D. Roberts, entitled "Deformities of the Face, with Special Reference to Nasal Plastics." Some of his methods are very unique and appear to have given him good results.

Such men as Tagliacozzi, Langenbeck, Ollier, Senn, Keegan, Roe, Bunger, Dieffenbach, Fraefe, Blaudin, Serre, Jobert, Zeis, Warren, Mutter, Pancoast, Post, Buck, Andrews, Prince, Seymanowski, Reverdin, Krause, Thiersch, Wolfe, Joseph von Eiselsberg, J. B. Murphy and Carl Beck, Chicago, must be recognized as great workers in this line of plastic surgery.

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THE CORRECTION OF NASAL DEFORMITIES.*

BY JOHN O. ROE, M. D., ROCHESTER, N. Y.

In compliance with the request to take part in this discussion on "The Correction of Nasal Deformities," I shall confine my remarks to a brief discussion of the subcutaneous method, which does not involve injuries to the skin, except in those cases where it is necessary to remove unsightly scars that would remain a pronounced blemish to a nose, however comely in size, shape and general conformation it might otherwise be.

There is no class of operations that demand in every case a more careful preliminary study of all the conditions presented—not only in respect to the abnormal state of the tissues to be operated upon, but also in respect to the possibility of obtaining the desired surgical result—than those operations required for the correction of nasal deformities.

In studying the etiology of nasal deformities it must be borne in mind that such an abnormal condition may be due to a great variety of causes. It may be due to an abnormal development of the nose, an overgrowth amounting in some cases to an elephantiasis; or it may be due to an unequal growth of the two sides of the nose, or of the two sides of the laminae of the septum, distorting both the septum and the nose. The distortion may be the result of an extra or intra-nasal neoplasm, or, as is frequently the case, of a traumatism with a definite history, or presenting a pronounced mark of the injury. It may be of constitutional origin with a leutic history, presenting the definite specific manifestation shown in the excavated, shrunken and caved-in nose that results from the destruction of the bony or cartilaginous framework, or perhaps of both, and sometimes shown in the dactylitic condition occasionally seen. The deformity may be the result of lupus that has been arrested, leaving scars and deformities, which must be carefully differentiated from leutic manifestations. The abnormal condition also may be of a tuberculous nature, associated with similar manifestations in other parts of the body, or finally, it may be caused by ulceration or by a growth of a malignant nature.

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*Symposium paper presented at the 14th Annual Meeting of the American Laryngological, Rhinological and Otological Society at Pittsburg, May 29, 1908.

Having ascertained the etiology of the deformity, we can then intelligently examine the nose to determine the exact nature of the deformity, the condition of the tissues and the anatomical structures, both external and internal, that are affected by or that enter into the deformity.

After this careful study of the cause and nature of the deformity it is necessary to consider the possibility of obtaining the result desired in its correction and to advise intelligently as to the desirability of the operation and the probability of its being a success. It may be said on general principles that the correction of a deformed nose, in which so much is involved to both the patient and the surgeon, may be likened to matrimony, which "should not be entered into unadvisedly or lightly, but reverently, discreetly and advisedly."

In all cases in which the deformity of the nose is associated with or caused by a constitutional condition. such as lues, no attempt to correct the deformity should be made until the constitutional condition has been most thoroughly treated and all manifestations entirely removed.

Without this precaution being taken the operation would be quite sure to be a failure, the disease would be excited to a greater local activity, the healing of the wound prevented, thereby resulting in greater destruction of tissue from abscess or ulceration and an increase in the deformity. When the constitutional disease has been completely arrested and all local manifestations quiescent for a considerable time (for say six months) in most of such cases little or no difference from non-specific cases will be seen in the healing of the wound, if the blood supply has not been cut off by cicatricial tissue, and if care is exercised during the operation to interfere with it as little as possible. These specific cases, however, at best must be regarded as an uncertain quantity, and will sometimes disappoint us or "go bad" when least expected.

If the deformity of the nose is found to be associated with a local disturbance inside the nose, obstructing the passages, we should invariably remove or correct this local condition, whether it be a deviation or thickening of the septum, enlargement of the turbinates, a polypoid or other growths, or even adenoids and large tonsils.

To preserve perfect nasal respiration is of the utmost necessity, not only to the health and comfort of the patient, but to the satisfactory correction of the nasal deformity.

Having determined on the advisability of the operation, the operation itself must now be carefully studied as related to the condition and position of the tissues, the relation of the different parts of the nose to one another, and the relation of the shape of the nose to that of the face.

In studying the normal nose of different types of faces we find that the noses of people having broad or eurygnathous faces with prominent malar processes and orthognathous jaws tend toward the Grecian in outline; and as this type becomes more accentuated the nose becomes more flattened in the center and thickened at the end, with more expanding wings; when, however, the shape of the jaws merges into the prognathous type, the nose becomes Roman in form.

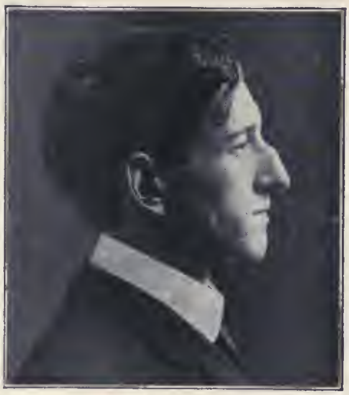


Figure 1.

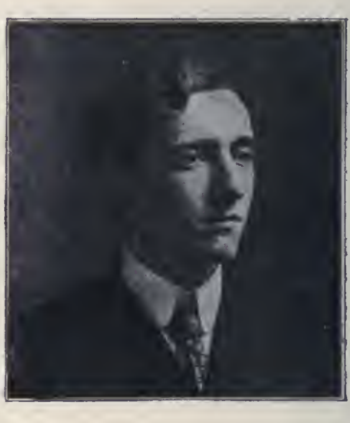


Figure 2.

People with narrow faces, small malar processes and orthognathous jaws have narrow, thin and aquiline noses, the aquilinity increasing as the jaws incline toward the prognathous.

The narrow face, undeveloped and retrousse nose, prognathous upper jaw and projecting incisor teeth are most distinctly the mark of an interference with or a distortion of development due to mouth breathing in infancy and childhood so often caused by enlarged tonsils and adenoids and other naso-pharyngeal obstructions.

In correcting a nasal deformity and reconstructing a nose careful attention must therefore be paid to these various conditions.

While symmetrical relations of the different portions of the nose to one another are of the greatest importance, the symmetrical relation as to the size and shape of the nose to the general contour of the face must also be carefully considered, in order to approach the ideal from an artistic standpoint. If we superimpose an aquiline nose on a broad face with pronounced malar processes we have an incongruity quite as pronounced as putting a small Grecian nose with a low bridge on a narrowly constructed face, as is shown in three or four of the illustrations. The aquiline nose in figure 16, which is very becoming to the young man with a narrow face, would ill become the broad face of the patient in figure 12 or 18; and the comparatively small Grecian nose in figure 12 or 18 would very seriously detract from the character of the face in figure 16.

A complete description of the technique is scarcely possible, for the reason that in no two cases are the same conditions present requiring the same procedure. Roberts, in his lectures on "The Surgical Treatment of Disfigurements and Deformities of the Face," very truly says:

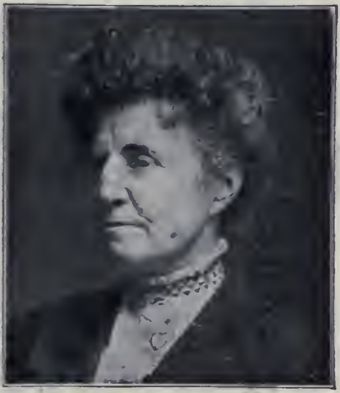


Figure 3.

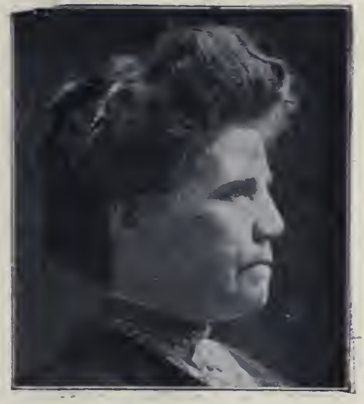


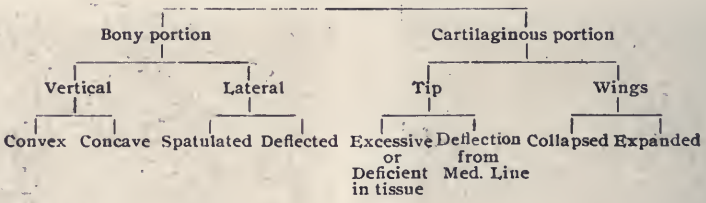
Figure 4.

"It is difficult to give definite directions for geiloplastic procedures, because the surgeon must be governed by the peculiarities of the case under observation. Almost every time one operates the method must be varied to meet the requirements. Often, indeed, the necessities of the case determine the line of incision only after the operation has been commenced."

This is equally true of subcutaneous plastic work. On general principles it may be said that the first step in the operation is to carefully raise the skin without injuring it from the deformed portion, the incision being made from the inside of the nostril anterior to the deformity, and the redundant portion cut away or placed in the depressed portion, so as to make the nose symmetrical and give it the shape we desire. Except in very large noses, as in figure 1, it is rarely necessary or desirable to remove any portion of tissue or even bone, for there is generally a correspondingly depressed portion that requires filling up to give the nose the proper shape. This is particularly the case where the cause of the deformity is traumatic, when we simply have a displacement rather than a destruction of tissue, which should be restored, so far as possible, to its former position.

In 1898, in an article on this subject, which I read before the British Medical Association, I classified nasal deformities as follows:

DEFORMITIES OF THE NOSE.



I here reproduce this classification for reference, as it is the one I use, and the one followed in the report of the following cases that I have selected to illustrate the different points of the technique of the subcutaneous method.

Case 1. Convex vertical deformity of the bony portion of the nose. Mr. J., aged 23, injured his nose six years before in a fistic encounter, which caused an exostosis of the nasal bones. The end of the nose was abnormally long, due to an elongation downward of the triangular cartilage, shown in figure 1. On examination there was found also a deviation of the osseo-cartilaginous portion of the septum to the right, obstructing this nostril, the left nostril being greatly narrowed by a marked projecting of the nasal process of the superior maxilla.

The first thing done was the straightening of the septum and the removal of sufficient of the nasal process of the superior maxilla to render the nasal passages entirely free. The exostosis of the nasal bones was then removed by carefully sawing them off on a line, so as to leave the dorsum of the nose straight, having first elevated the skin from this region through an incision on the inside of the alae. As there was no depression to be filled in, the portions that were sawed off were removed. When completely healed, the elongation of the lower end of the triangular cartilage was resected and the ends strapped back in place, which when healed gave the most excellent result shown in figure 2.

Case 2. A similar convex vertical deformity. Mrs. G., aged 40, injured her nose three years ago last July by falling from her bicycle. The front wheel stuck in a rut and threw her over the handle bar, her nose striking a stone. When the swelling had subsided she experienced much difficulty in breathing through the nose. One year later this obstruction, in the form of a bone, was removed, evidently a portion of the deviated septum, which resulted in the sinking-in of the dorsum of the nose. Six months after this a friend of mine in another city, who believes in the efficacy of wax, filled this depression, or rather, overfilled it, with paraffine, with the result as shown in figure 3. In addition to this marked bulging of the dorsum there was a pronounced redness, which still further disfigured her nose.

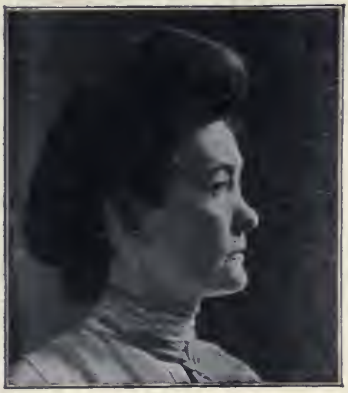


Figure 5.

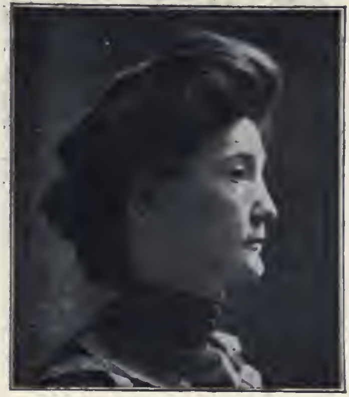


Figure 6.

In the correction of this deformity several operations were required. First, the tissue containing the paraffine was removed sufficient to bring the dorsum of the nose down nearly to a straight line. This was done subcutaneously through an incision on the inside of the ala. When this had healed, three weeks later, the distorted end was put in shape by raising the skin and filling in the depressed portions with flaps from the elevated portions. The tissues healed tardily where the paraffine had been injected, and later developed a tendency to swell when the external pressure from the dressing was removed, and after a time it became so enlarged that it was found necessary to remove some of this tissue to compel the nose to heal in the desired shape, as shown in figure 4.

Case 3. A concave vertical deformity of the bony portion of the nose, the result of an injury. Miss M., aged 25, fell from the second story window upon a piazza railing, when five years old. She was at the time leaning out of the window and fell head foremost, striking on her nose. The nose at the time became much swollen, but as no physician was at hand she was attended by a nurse, and no attempt was made to replace the fractured fragments of the nasal bones. When the swelling subsided the bridge of the nose was found to be very flat, almost on a line with the face, but as it was thought nothing could be done to relieve the disfigurement no further attention was given to it. Figure 5 represents the condition of the nose at the time I saw her, February 22, 1906.

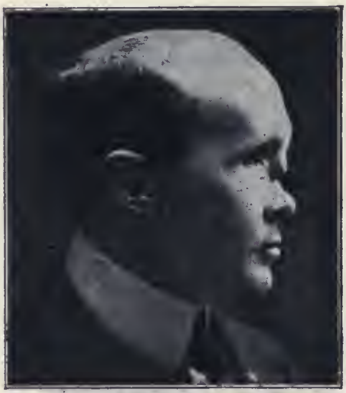


Figure 7.

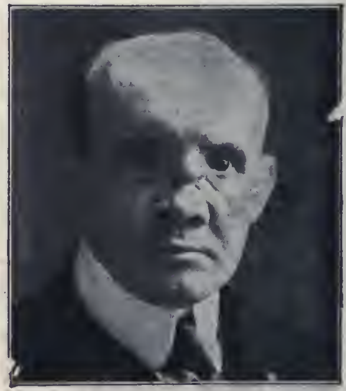


Figure 8.

On examination the nasal bones were found displaced outward and downward, leaving two well marked ridges on either side. The end of the nose was abnormally enlarged and the wings expanded. The nasal passages were very much obstructed by ridges and thickening of the septum, that resulted from the impaction of the perpendicular plate of the ethmoid, and by marked turbinated hypertrophy on both sides.

Before correcting the deformity of the nose it was necessary to render the nasal passages free by a reduction of the turbinates in the usual way, and the submucous resection of the septal excrescences. The external deformity was then corrected by elevating the skin from the depressed portion through an incision made from the inside along the upper border of the lower lateral shield cartilages. When this was done the periosteum was raised about ten millimeters outside of the displaced nasal bones. Projecting portions of the nasal bones were then sawed off and put in the medial line, together with the periosteum that had been elevated from the bone just outside of them. These were carefully held in place by an external dressing, so as to maintain them in this position until union had taken place. After the parts had thoroughly healed, the remaining depression below was filled in with the redundant tissue in the end of the nose, which was carefully cut into a flap and turned into the depression. This was also held in place by an external dressing until thoroughly healed, which left the nose in the condition shown in figure 6.

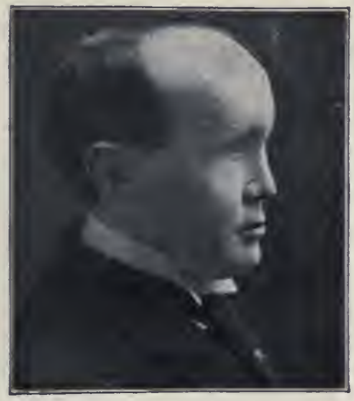


Figure 9.

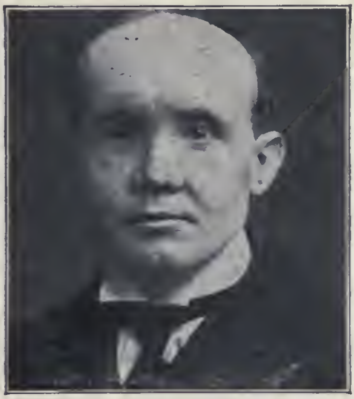


Figure 10.

Case 4. This is an exceedingly interesting case, involving both a serious concave vertical deformity and also a deflection of the bony portion of the nose. The deformity, as shown in figures 7 and 8, had resulted from being thrown from a carriage by the breaking of the forward axle, and in the fall striking the nose upon the sharp edge of a tramway rail, causing a most frightful injury to the face, the loss of the sight of the right eye, together with a concussion of the brain, which was so severe that life was despaired of for several days after the accident. The injury to the nose completely severed the lower portion of both nasal bones, flattening the lower depressed portion completely to a level with the face, leaving the stump of the nasal bones projecting above like a ledge, as shown very clearly in figure 7, and the fearful scarring that resulted when the wounds healed is shown very well in figure

8. The septum was also so distorted to the left as to completely occlude the left nostril, and the knocking inward of the center of the nose had caused the end of the nose to be tilted upward and to the right, as is also shown in figure 8. As the patient formerly had quite a large nose, the end therefore appeared by comparison with the remaining portion abnormally large.

Several operations and much careful attention were required in the correction of this deformity. The first one consisted in the raising of the skin from the central portion of the deformed part through an incision from the inside of the ala, which, owing to the firm attachment of the skin in many places to the parts below, at the site of the scars, proved to be a very difficult procedure. When this was done, a portion of the projecting nasal bones was sawed off through this incision with a nasal saw and placed in the depression below. In order to be certain of the bone's uniting quite firm pressure by the external dressing was necessary in order to keep the parts in firm coaptation. When the parts had healed from this operation, after about three weeks, the skin was raised from the lower end of the nose and also from the dorsum of the depressed portion in the center, and a flap made from the tissue in the end of the nose and turned into the portion still depressed, which elevated the center of the nose still farther. When this had healed a flap was turned in from the ridge of the tissue on the left side of the nose, and likewise from the right side, and in this manner the nose was built up until we had the symmetrical result shown in figures 9 and 10.

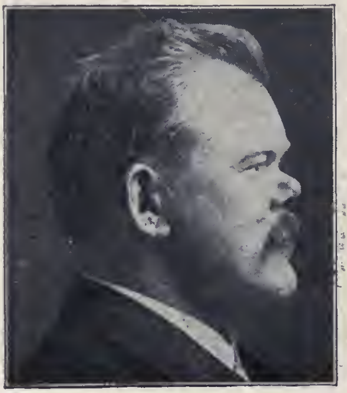


Figure 11.

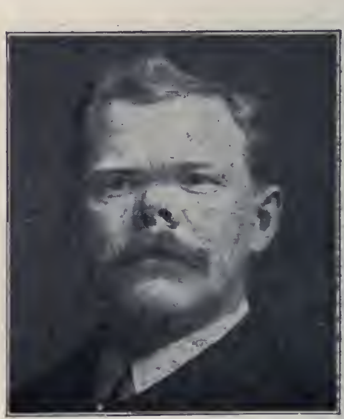


Figure 12.

The result in this case was highly gratifying, but required much patience, both on the part of the patient and the operator. The only disfigurement then remaining was the right eye, which was lost at the time of the accident. This, however, was rectified by the insertion of a glass eye by his oculist at his home, who had referred the patient to me.

Case 5. A. S., aged 34, a resident of Helsingfors, Finland, was kicked in the face by a horse when a year and a half old, fracturing the nasal bones and driving them inward. On examination the nose showed a concave vertical deformity of the bony portion of the nose, with a scar on the left side of the nose over the nasal bone, which drew the left ala up considerably above the other. The septum was irregular, with a large enchondroma on the left side.

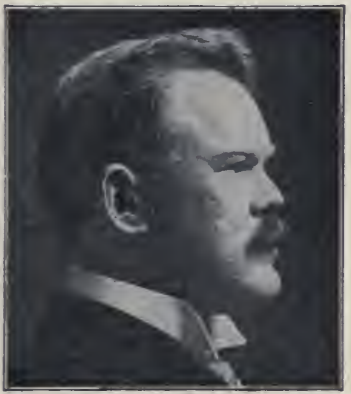


Figure 13.

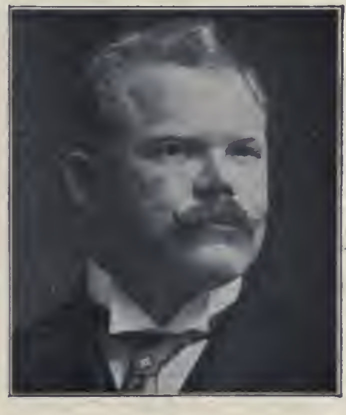


Figure 14.

In correcting this deformity the interior of the nose was first put in order, and the enchondroma removed by a submucous resection. The external deformity was corrected by carefully raising the skin from the dorsum of the nose through an incision just inside the ala, near the tip of the nose. The skin in this case was firmly attached to the nasal bones at the seat of the injury, but by thus freely liberating it the left ala was brought down on a line with the right ala. A flap was then made of the redundant cartilage at the end of the nose and turned up into the depressed portion between the eyes. The triangular cartilage just above the tip of the nose was then sufficiently liberated by a beveled incision from above downward, so that the end of the nose could be brought down, making the lower end of the nose almost horizontal. The nose was then held in place by a metallic splint, formed to the desired shape of the nose, which was held in place until union of all the parts had taken place. The nose was then comparatively satisfactory, excepting two or three minor defects, that required slight operations, and when these were healed the nose was left in a highly satisfactory condition. Figures 11 and 12 show the nose before, and figures 13 and 14 after the operations.

Case 6. A young man, aged 28. There was in this case deficiency in tissue of the cartilaginous portion and a lateral deflection to the right of the bony portion, as shown in figure 15. There was also a marked expansion of the alae on both sides. The deformity had resulted from a fall when a child, before he could remember. On examination of the interior of the nose the septum was found slightly deviated to the right, with a knuckle of cartilage obstructing the right nostril. The left passage was much obstructed by a large posterior inferior turbinate hypertrophy. The operation for correcting this deformity was quite similar to the previous cases: the skin was raised from the deformed part, the marked thickening on the left side of the nose above was sawed off, and the portion removed placed in the depression below. The deformity of the lower third of the nose was corrected by taking off the elevated portion and turning it in by a flap operation into the depressed part. When this had healed the dorsum of the nose was quite straight and symmetrical, but the alae were still abnormally spread out, owing to an unusually wide attachment. This condition was rectified by severing the lower attachments of the cartilages subcutaneously with a slender knife, similar to a tenotomy knife. When this was done the attachments of the alae were

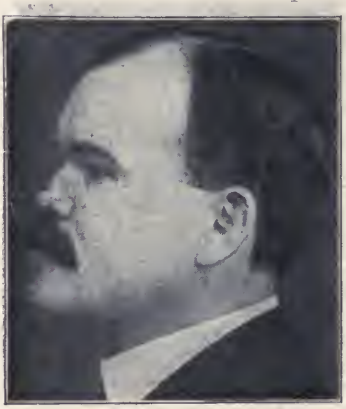


Figure 15.

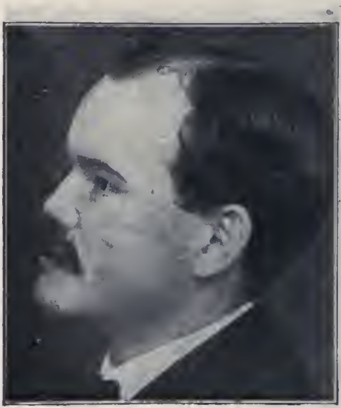


Figure 16.

carried inward and stitched in the position desired by means of the writer's intra-nasal suture needles, horsehair being employed for the suture, and when healed the nose was left in the condition shown in figure 16.

Case 7. W. H., aged 40. This case represents a condition we often find resulting from traumatism, combining two or three different deformities in one nose. In this instance we have a depression of the upper cartilaginous portion of the nose, and a convex vertical deformity and lateral deflection of the bony portion, as shown in figure 17,—the result of an injury from a fistic encounter with some boys when ten years old. He has had since the injury much difficulty in breathing through the nose. On examination the left nasal bone was found displaced to the left, together with the upper dorsal cartilage. The triangular cartilage was excessively thickened, which had resulted from the crushing of the dorsum at the time of the injury. The tip of the nose also was much enlarged.

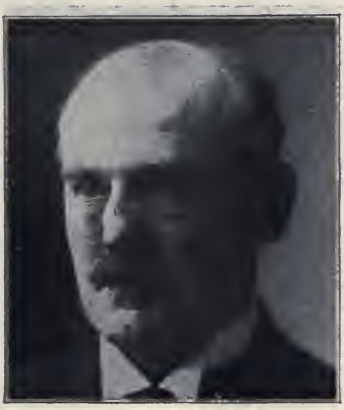


Figure 17.

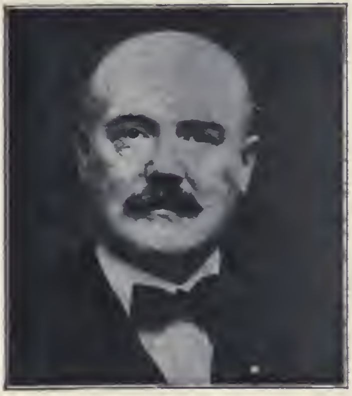


Figure 18.

In correcting this deformity it was necessary first to reduce the thickening of the septum by resecting a portion of it by the submucous method, so as to render the nasal passages free. The external deformity was corrected by first elevating the skin from the deformed part, and turning up a portion of the redundant tissue in the end of the nose by a flap-operation into the cartilaginous depression. A portion was then removed from the projecting nasal bone, and also placed in the depression below. The nose was then dressed with a supporting splint on the outside in the form of a saddle, and held in place until healed. Two minor operations were required to level some slight irregularities that remained, when the nose was left in the condition shown in figure 18.

Case 8. Concave vertical deformity of the bony portion of the nose and a marked thickening of the cartilaginous portion. Miss Y., aged 21. When six years of age, while ill with an attack of tonsillitis, she attempted to go down stairs, but was so weak that she fainted and fell the whole length of the stairs, striking on her nose. The nose became very much swollen and infected with erysipelas, which extended over her whole face. At the end of two weeks the erysipelas had subsided, leaving the nose almost completely flattened in the center.

At the time I saw her the nasal bones were flattened and dislocated outward. The sesamoid and upper shield cartilages in the dorsum of the nose had been destroyed, while the tip of the nose and alae were large and very much expanded, as shown in figure 19. The operation for the correction of this deformity consisted in dissecting up a portion of this redundant tissue in the end of the nose and turning it back in the form of a flap into the depressed portion. The incision in this case was made just inside the border of the alae, raising the skin from the part that was to be dissected up and also from the depressed portion. When this was done the parts were held in place by a saddle splint on the top of the nose, free drainage being allowed from the inside. When the parts had healed and all the swelling subsided, the nose was not quite perfect, requiring a second operation similar to the first to raise the center to the desired height, and also to depress the tip and make the nose symmetrical, as shown in figure 20.

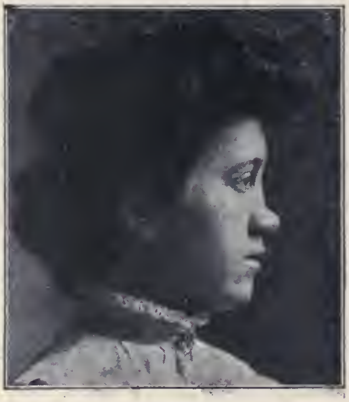


Figure 19.

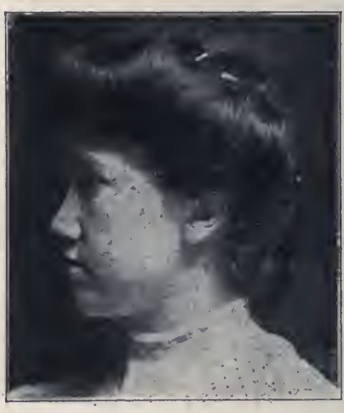


Figure 20.

Case 9. Excessive development of the tip of the nose with an enlargement and expansion of the alae, shown in figure 21. Mrs. W., aged 30. In this case there was no history of traumatism. The exuberant growth of the end of the nose had evidently resulted from persistent turgescence caused by intra-nasal pressure and obstructed nasal passages due to marked enlargement of the middle turbinates and anterior ethmoid cells, and also to lower posterior turbinate hypertrophy. Preliminary to the correction of the external deformity, the nasal obstructions were carefully removed, as in the previous cases. The enlarged ethmoid cells were obliterated by submucous resection of the inner bony wall, and the passages were maintained free by careful packing with iodoform gauze until healed. The external deformity was corrected by cutting flaps of the redundant tissue at the end of the nose and turning them back along the bridge, after having elevated the skin over this region. When this had healed the inflated and bulging condition of the shield cartilages was reduced by carefully incising the cartilages from the inside and strapping and holding them in place in the desired position. When this was done the nose was found to be too long in proportion with the rest of the face. This was rectified by the removal of a triangular piece of the septal cartilage and suturing the parts back in place, which left the nose when completed as shown in figure 22.

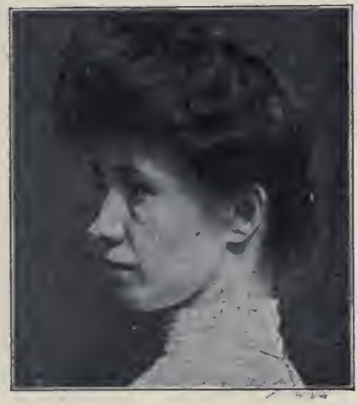


Figure 21.

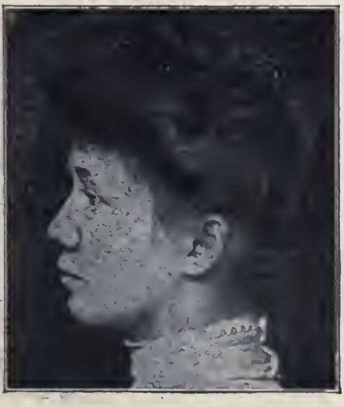


Figure 22.

Case 10. Congenital enlargement of the entire nose, shown in figure 23. Miss M., aged 23, had had from infancy an unusually large nose. This deformity greatly annoyed her, so much as to be a positive hindrance to her in her dramatic work. The mode of reducing the size of the nose consisted first, in sawing off a portion of the nasal bones and paring them off, subcutaneously, to lower the nose to the desired dimension. After healing, the skin was carefully raised from the lower portion of the nose and portions of the shield cartilages were resected. The nose was then carefully strapped, so as to hold it in place, in the desired shape and held there until completely healed, leaving the nose as shown in figure 24, which appears as a fine symmetrical nose, being several sizes smaller than before the operation.

In the correction of nasal deformities by the subcutaneous plastic method, quite as much care must be exercised as by the external skin flap method. If too much tissue is taken from any particular part a depression will result; if too much is put in a hump will be left. If the skin is injured an undesirable scar or redness or other disturbance of the skin will result.

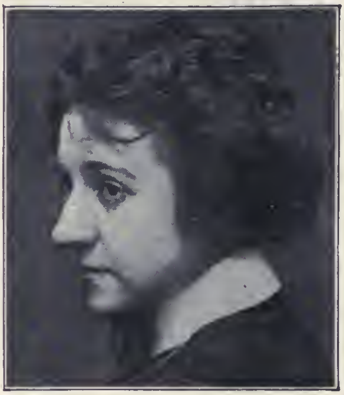


Figure 23.

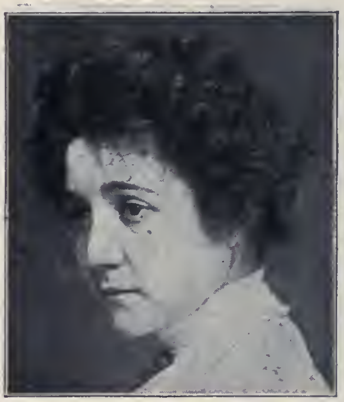


Figure 24.

Quite as much patience and perseverance is required as by the other method, for subcutaneous wounds are quite as slow to heal as external wounds, and frequently more so, owing to the disturbance in the circulation often required by the quite extensive cutting we are sometimes obliged to do. It is on this account that we often have persistent swelling of the nose on removal of the external dressing for some time after the tissues are apparently healed. In these cases it is absolutely necessary to wear the dressing with sufficient pressure to keep this swelling down until the parts have become so healed that this tendency has completely disappeared.

In some instances patients have become so impatient to be freed from their nasal dressing that I have been induced to remove it prematurely, and later they were rewarded for their impatience by being obliged to have another operation which a little longer wearing of the dressing would have avoided. As I have said before in previous papers on this subject,* the reward of patience and perseverance, in these cases is the satisfaction of success on the part of the surgeon and a perfect nose on the part of the patient.

44 Clinton Avenue, South.

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*Amer. Med. Quarterly, June, 1899.—Medical Record, New York, July 1st, 1905.

Amaurosis after a Prosthetic Injection of Paraffine for Saddle Nose.

W. Mintz. *Revue Hebdomadaire de Laryngologie, d'Otologie et de Rhinologie*, Nov. 25, 1905.

The case was a patient of 25 years, on whom in 1903 an injection of paraffine had been made for correcting this nasal deformity. As the injection had been insufficient for perfect correction, the author repeated the injection and, about 15 millimetres from the point of the nose, first on the right and then in the left side, he injected a small quantity of paraffine at 43 degrees (cent.)

Three minutes after the injection, pain developed in the left eye, which rapidly became blind. There was much vomiting, the following day there developed symptoms of venous stasis, such as disturbance of the cornea, exophthalmos and paralysis of the eye muscles. The skin surrounding the point of the injection became gangrenous.

Evidently there had developed a thrombosis of the external nasal veins, and extending as far as the inferior ophthalmic vein and the central vein of the retina and thence to the principal branches of the ophthalmic vein and the cavernous plexus.

We should therefore recognize the possible dangers of such a prosthetic injection and try to prevent them.

Scheppegrell.

THE CORRECTION OF NASAL DEFORMITIES BY THE USE OF PARAFFIN.*

BY HARMON SMITH, M.D., NEW YORK.

So much adverse criticism has been brought to bear upon the subcutaneous injection of paraffin, and so many dangers have been enumerated as possible sequelae to its use, that I have deemed it wise to investigate by personal inquiry the causes which have occasioned the criticism and the conditions which have contributed to the bad results. . To this end I sent out to all those engaged in this work a circular letter requesting information as to the following points:

1. Total number of cases injected for the correction of nasal deformity.
2. Number of successful cases.
3. Number of unsuccessful cases.
4. Attributable cause of non-success.
5. Number of cases of blindness due to embolus.
6. Number of cases of sepsis resulting in abscess and loss of paraffin.
7. Number of cases where paraffin lodged in undesirable location at time of operation.
8. Number of cases where paraffin shifted after operation.
9. Instrument used for injection.
10. Kind of paraffin used and melting point.
11. Methods employed to prevent paraffin entering undesirable localities.
12. Conclusions: Do you consider it dangerous, undesirable, unwarrantable, or practical?

I received ninety-one replies to the letters sent. Of this number forty-one surgeons had made paraffin injections for the correction of nasal deformities in one or more cases; forty had had no experience, and ten had had too little experience to express an opinion. I have not included my own experience in these statistics, but I wish to say that in over two hundred injections for the correction of nasal deformities I have had only two unsatisfactory results, citation of which will be given later.

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*Symposium paper presented at the 14th Annual Meeting of the American Laryngological, Rhinological and Otological Society at Pittsburg, May 29, 1908.

The history of paraffin injection is now an old story, and I only wish to call attention to the fact that it was first employed for the correction of nasal deformity by Gersuny of Vienna, in 1900.

In the summer of 1901 I began to experiment with the injection of liquid paraffin upon rabbits and upon the cadaver, and in November of 1901 I made my first injection in the nose of a young woman at the Manhattan Eye, Ear and Throat Hospital, at which time I used an ordinary hypodermic syringe and liquid paraffin with a melting point of 110° F. This case is still under my observation, and there is apparently no necessity for further injection. From outward appearances the nose remains the same in size and shape as when it was injected.

Causes of Nasal Deformities.—

1. Traumatism. This has been the most frequent cause of nasal deformity in those cases coming under my observation, and I believe it to be the most frequent in the experience of all operators.
2. Syphilis.
3. Abscess of the septum.
4. The removal of the cartilage of the nose in the submucous resection for deflected septa (Wm. E. Casselberry has had such a case.)
5. Lupus of the septum.

Selection of Paraffin and its Preparation. Too much importance cannot be attached to the selection of the proper substance for injection, whether it be purely paraffin or a mixture of paraffin with other substances.

The desirable substance is one with a sufficiently high melting point to reduce to a minimum globular formation when injected, and yet not sufficiently hard to produce inflammatory conditions by constant irritation of the subcutaneous tissues.

Liquid paraffin, or paraffin with a melting point below the body temperature, may readily enter the circulation or gravitate between the loose areolar tissue to undesirable locations, while hard rubber and celluloid invariably produce inflammatory conditions by their hardness, and slough out.

Emboli have frequently followed the injection of paraffin with a melting point of 92° to 100° F., or when paraffin of a higher melting point has been injected in a semi-liquid state. When the paraffin is liquid or semi-liquid, it permeates the meshes of connective tissue and assumes small spherical shapes, which can unquestionably be taken up by the blood vessels.

My first observations upon the tissues of a rabbit when paraffin had been injected in a liquid state and with a melting point of 110° F. led me to suppose that a fibrosis occurred around each globule of paraffin, but later observations have shown that these globules were only surrounded by connective tissue of the part, and further, that only the larger masses of the paraffin were encapsulated with fibrous tissue when injected cold.

Without citing the various experiments upon the subject, and omitting the arguments of those favoring a soft paraffin, or those advocating a paraffin with a melting point as high as 155° F., I would say that a paraffin with a melting point of 115° F. would meet the requirements, and, if injected cold, would obviate the tendency to embolus formation, and yet be of sufficient hardness to produce a fibrous capsule which would prevent its subsequent shifting.

The conclusions of Luckett and Horn, after repeated experimentation, are that the more solid the paraffin at the time of injection, the more apt it is to be confined to one mass, and the less likely is it to spread throughout the tissues.

In 1904 I removed a section of tissue from the nose of a patient whom I had injected with liquid paraffin two years previously, and the observations made at that time by Dr. Jonathan Wright have in a measure been substantiated by more complete experimentation in the last few years. He called attention to the fact that some of the paraffin must have been carried off by the lymphatics, which was made easier of accomplishment by the fact that the paraffin was injected in liquid form. He further commented upon the specimen, saying: "Had not the experimental observations of others thrown the weight of opinion otherwise, one would naturally suppose from the examination of this specimen that the paraffin on entering the tissues was split up into separate globules, which gradually became surrounded each by its capsule of fibrous tissue. A fluid or semifluid, it would seem, would tend to flow along the lymph channels of least resistance and be broken up into larger and smaller globules. On the other hand, it is a little difficult to understand how the new connective tissue cells can shoot into a non-porous substance. This difficulty of conception is still further increased when we consider the use of melted paraffin which on hardening would seem to offer an impenetrable mass to the invasion of connective tissue cells.

"In the semi-solid compounds with petroleum jelly, such as were used in this case, we, perhaps with less difficulty, can imagine the intrusion of the antennae of an amoeboid cell. Some of the animal experiments are not very satisfactory, when we remember the exceedingly loose subdermal connective tissue, as for instance in the rabbit.

"I would draw your attention to an interesting histological feature shown in Fig. 2, which I think has also been noted by other observers. The latter have been referred to as giant cell formation, and perhaps in their specimens such evidence existed as to warrant the description. I think, however, here it will strike the observer that the large cells imperfectly lining the cavity in which the paraffin lay, are really nature's attempt to line it with the same sort of covering as that which lines the joints, the lungs, etc. Here it is clear these large cells are developed from the endothelium of the lymph spaces. Naturally, with giant cell formation we think of a pathological condition set up by a foreign body—here we think of a physiological, though artificial cavity, a more or less complete adaptation of the organism to new conditions.

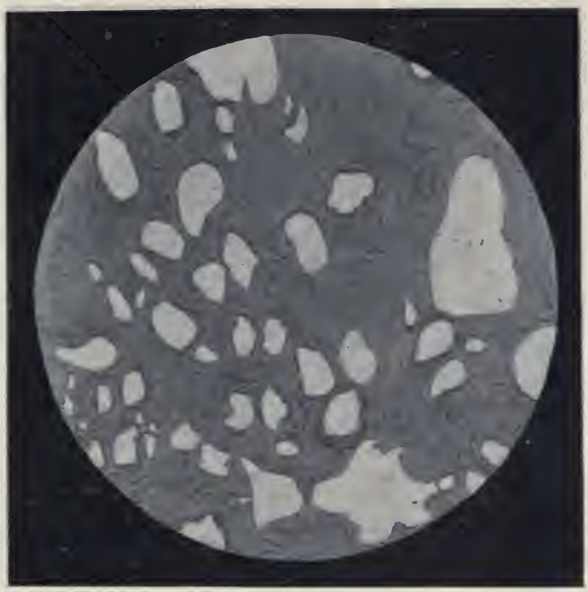

Figure 1. Microscopical appearance of paraffin in the tissues of the nose. Piece removed from nose of patient two years after injection.

"While we should naturally expect in such injections that the paraffin would at first be arranged in one lump, this is not what we should expect in the firmer connective tissue of man. It seems to have been shown that this more or less discrete lump in animals, beneath the skin, does finally become split up by the intrusion of connective tissue cells. If this be so, there is no reason why it should not also occur in man, though at first the infiltrating paraffin may be more diffusely scattered through the lymph spaces."

Permanence.—The permanency of the paraffin in the tissues depends upon the melting point of the paraffin and the state at the time of injection. The colder the paraffin at the time of injection, the more lasting it will be in the tissues, likewise the better the anchorage insured.

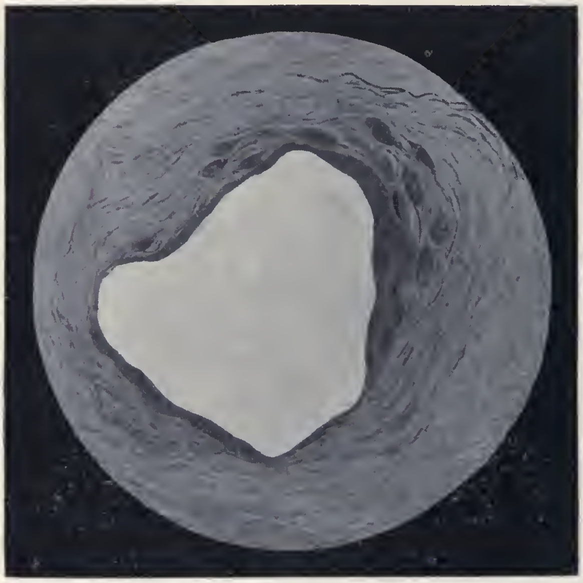

Figure 2. Microscopical appearance of one of the islands of paraffin under high power, showing the endothelial lining of the cavity.

Paraffin Mixture.—For a number of years I have used a paraffin with a melting point of 110° F., and the statistics show this to be the melting point most used. This paraffin was obtained by adding to commercial paraffin melting at 140° F. sufficient petroleum jelly to bring it down to 110° F. However satisfactory this paraffin has proven in my hands and in the hands of my colleagues, I am now inclined to believe that a higher melting point would be more practical, and have recently used a paraffin prepared in the same manner, but with a melting point of 115° F. This, if injected cold, will be even less liable to assume a small globular shape, and will reduce still more the danger of an embolus. It has also the advantage of forming for itself a berth of connective tissue which will insure against subsequent displacement. A third point in its favor is that in very hot climates, or when a patient is subjected to extreme heat, there will be less tendency to soften.

The liquid paraffin called albolene is decidedly preferable to vaseline in reducing the melting point of the hard paraffin. Various combinations have been made in the preparation of a suitable substance for injection. White wax, rubber and wax, and rubber and paraffin, all have had their advocates. However, I can find no possible objection to the hard and soft paraffin, properly prepared, and with a melting point of 115° F.

Instruments for Injection.—At first it was deemed necessary to keep the paraffin liquid in order to inject it, and to meet this requirement numerous ingenious devices were constructed. Quinlan devised a syringe with a hot water jacket which was supplied constantly from a tank of hot water; Eckstein placed rubber tubing over the barrel of his syringe to preserve the heat; Walker Downie constructed one with the outside surrounded with a continuous platinum wire, which was kept hot by a current of electricity. All of these syringes having the preservation or the generation of heat as their object, were readily supplanted by one capable of expelling the paraffin in a solid state.

I devised a metal syringe with a screw piston, which would enable the operator to expel the paraffin cold. This syringe was presented to the American Laryngological, Rhinological and Otological Society in Washington in May, 1902, and was the first of its kind, so far as I know. This syringe possesses all of the qualifications necessary for the injection of solid paraffin, and has the advantage over a ratchet injector in being able to control the amount of injected paraffin to a fraction of a drop; while the injector necessitates injecting all of that which is included in the space controlled by a notch of the ratchet. (Figure 3, paraffin syringe.)

Broeckaert was the first to introduce the ratchet injector, since which others have added to the number. The injector has the advantage over the syringe in that one may inject with one hand and mould the paraffin with the other. It is also a better instrument for injecting turbinates, in cases of atrophic rhinitis. Pfau has manufactured a very complete instrument of the injector variety.

However, for practical purposes my screw syringe is as safe and satisfactory as any instrument that I know of. I believe a curved steel needle of large calibre and two inches long is the one best adapted to the purpose.

Suitable Cases for Injection.—Too much stress cannot be placed upon the selection of suitable cases for injection. The majority of bad results may be attributed to the improper selection of cases for operation. Syphilitic cases in which some activity is still present should not be injected, nor should any specific case be operated upon until a thorough anti-syphilitic treatment has been administered for some months. No case should be injected where all of the cartilaginous septum has been destroyed, as there is nothing below to support the paraffin above. No diabetic nor nephritic case should be injected, as the low vitality of the tissues will not stand an increased strain. Scar tissue is always poorly nourished, and great care and judgment should be exercised in the attempt to liberate it from its source of nourishment and to make upon it an additional call for self-maintenance. Small quantities of paraffin should be injected beneath scar tissues at long intervals. No attempt should be made to inject beneath tightly adherent skin where an additional tension will occasion pressure, for in such cases necrosis is likely to occur.

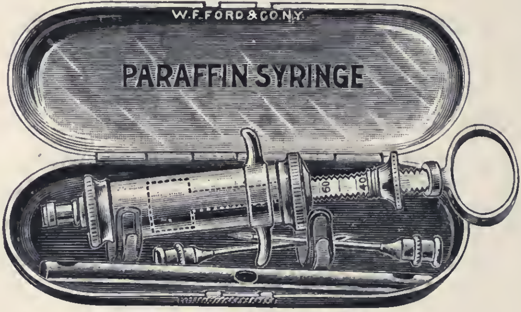

Figure 3. Paraffin syringe.

Furthermore, I do not believe in injecting any case unless deformity exists which detracts materially from the appearance of the patient and renders him peculiarly sensitive to his appearance. The injection of paraffin to overcome slight inequalities of profile and to gratify the whim of some over-sensitive patient is unwarrantable, in view of the fact that quite a number of cases have proven unsuccessful in their ultimate outcome.

Preparation of the Patient.

1. Scrub the nose and adjacent areas with green soap and water.

2. Pour on some alcohol.

3. Cover the head with a towel wet with bichloride of mercury, and cover the arms and shoulders with a sterilized gown. The same preparation should be made here as for any minor surgical operation.

Preparation of Instruments and Operator.—The paraffin syringe, which is of metal, and the needle should be boiled. The paraffin, which comes in sterilized tubes, should be again boiled in a metal cup, which can be placed in any sterilizer, the bottom of the cup being raised sufficiently to prevent the paraffin from scorching. The paraffin is drawn up into the syringe in a liquid state, after which the syringe is dropped into a receptacle of cold sterilized water, which soon solidifies it. The hands of the operator and the assistant are both sterilized. (Figure 4, paraffin cup.)

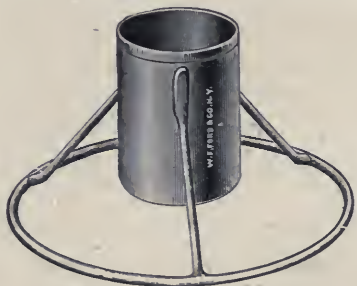

Figure 4. Paraffin cup.

Methods of Injection.—No anesthetic is necessary, although some operators prefer cocaine locally injected. I have found the cocaine as painful as the paraffin injection. I have the patient sit on a stool so that when the head is tilted backward the nose is about the height of the operator's elbow, with the arms hanging by the side. The operator stands on the left of the patient, and the assistant stands in front of and slightly to the right of the patient. The assistant grasps the nose firmly with the balls of his thumbs pressed against the nasal bones, and with the tips touching over the root of the nose. In this way pressure is exerted along both sides of the nose, and will prevent the entrance of the paraffin into the areolar tissue around the eye, and will also prevent it getting into the circulation, should the needle penetrate a small vein. I always inject from above downward, as this is in a direction away from danger, and toward nature's natural barrier—which is the adherence of the skin and cartilage of the tip and alae of the nose.

Before the introduction of the needle I immerse it in hot water, and then give the piston several turns until the paraffin comes out in a hard cylindrical thread. The first few turns of the piston usually sends forth an interrupted stream of paraffin mixed with some oil and water, but in a few turns all of the oil and water have been expelled, and the paraffin remains, a solid block within the cylinder of the syringe.

At the point of injection I lift the skin up high with firm pressure and introduce the needle beneath the skin and into the areolar tissue above the periosteum. The point of the needle is carried just beyond the depression, when the injection is begun slowly and is continued as the needle is gradually withdrawn. I frequently stop the injection and mould the paraffin to meet the requirements of the case. During this time a second assistant holds the syringe, or the first assistant relinquishes his pressure and holds it while I note the results. I never make it an object to overcome the deformity at one injection, but in many instances I have found only one injection necessary. When anemia of the surface occurs I invariably stop further injection, as this is the danger signal that the tissue will stand no more. I withdraw the needle carefully and stop the hemorrhage, if there is any, with adrenalin, after which I put on a little collodion. If convenient for the patient to do so, I advise rest in bed for the remainder of the day, and the application of ice cloths. When the paraffin melts at 115° F. and is injected cold, it enters the tissue as a hard mass and cooling sprays are unnecessary.

A second injection should not be made sooner than a month afterward, for nature is having all she can do to take care of this first injection during this time, and any additional demand might result in necrosis.

Accidents.—The discussion under this head will be limited to those accidents resulting from injecting paraffin for the correction of nasal deformities.

Embolus.—There are three authenticated cases of thrombosis of the eye vessels immediately following the injection of paraffin for nasal deformity:

1. Amaurosis of the left eye, caused by thrombosis of the opthalmic vein, reported by Leiser in 1903 (Berliner Klinische Wochenschrift, 1903, p. 13.)

2. Amaurosis of the right eye, caused by thrombosis of the arteria centralis retinae, reported by Hurd and Holden in 1903. (Medical Record, July 11, 1903.)

3. Amaurosis of the left eye, with temporary hemiplegia of a mild character which disappeared in a few days, reported by Thos. H. Huntington, in November, 1904.

The report of these three cases immediately prejudiced nearly every operator against the use of paraffin, without a consideration of the probable errors entering into the operation. These errors I believe are absolutely preventable. Should all hypodermic injections be given carelessly, without expelling the air bubble, I have no doubt the death rate from air embolus would increase amazingly, yet no physician hesitates to give a hypodermic. Here is a possible error easily avoided. In all three cases referred to above the accident occurred at the time of a second or third injection. The fact that thrombosis occurred in the second and third injection in each case would tend to show that the increased vascularity of the area favored the transmission of any small particle of paraffin away from that location, whether it be a part of the newly injected substance or a detached portion of that previously injected.

In case II the paraffin was injected in a semi-solid state; and in case III it must have been in a liquid state, as Dr. Huntington tells me by letter that he used an ordinary hypodermic syringe, by which only liquid paraffin can be injected. In case I the method of injection is not given, although the melting point of the paraffin is given at 110° F.

In none of these cases is any mention made of protection, by pressure, to the soft tissues around the eye, against the invasion of the injected substance. Hurd's case was the only one where the injection was made from above downward, and this was immediately following one made from the tip upward. I believe these accidents were due *primarily* to the absence of protection by pressure at the sides and root of the nose against the migration of paraffin particles, and *secondly* to the use of liquid or semi-solid paraffin. Had a solid paraffin been injected, with a melting point of 110° F. or above, and the injection been made from above downward, and firm pressure been made at the root of the nose, as I have indicated, I believe the accidents might have been avoided. I have reports by letter of 1,250 cases of paraffin injection, in which number three cases of thrombosis have occurred. In ordinary mercury injections there are records showing as high a proportion as 8.9 per cent of embolism (Luckett and Horn.)

Four conditions favor abscess formation:

1. Unsurgical methods, resulting in infection.

2. A second injection following too closely upon the first. This error resulted in one of the unfortunate experiences I have had in the injection of paraffin.

The case was sent to me by Dr. L. G. Woodson, of Birmingham, Ala. The tissues were very tight over the depression, and at the time I advised against an endeavor to overcome all the deformity in one week, the time the patient had arranged for his stay in New York. However, I made two injections in the seven days, and the patient returned home perfectly satisfied with the result. I should have considered the operation a success had I not interviewed Dr. Woodson some months later, at which time he told me that in about two weeks after the patient returned home the tissues broke down and most of the paraffin exuded, although sufficient of it remained, or sufficient fibrosis resulted from the resulting inflammation to completely overcome the deformity. I had added here additional work to an already overworked area, with the result that the vitality of the tissue was overcome. A similar instance is reported by Richards, of Fall River.

3. Abscess with sloughing occurs in diabetic, nephritic, and syphilitic cases.

4. Infection and sloughing occurs when paraffin is injected into the skin instead of beneath it. The skin is poorly nourished over these deformities, and injection into its layers still further reduces the blood supply to that particular area. Again, infection may readily travel through a sweat gland if the injection is made too close to the surface. (Richard Lake, of London, reports one such case.)

It would certainly reflect upon one's surgical judgment to offer confident solutions of all these problems, but the mere statement of how they occur suggests the method by which they may be obviated.

Distribution to Undesirable Locations.—All of the reported cases where paraffin has entered undesirable localities not intended for injection have been when the injection was made with a semiliquid substance, with the needle pointing upward, and with insufficient precaution in regard to pressure.

With a solid paraffin, a screw syringe, with the needle pointing toward the tip, and with the fingers of an intelligent assistant to aid in the procedure, I believe there will be no case where paraffin will lodge in any other locality than the one desired. There may be one exception to this statement, and that is where considerable scar tissue exists at the site of the deformity, and the precaution to elevate this with a bistoury is not properly accomplished before the operation. Then, of course, the paraffin would go in the direction of least resistance.

Shifting of Paraffin Subsequent to Operation.—There are seven cases reported in my 1,250 cases operated upon. To this number I can add another of my own, which I have not seen, but which has been reported to me by Dr. W. E. Casselberry of Chicago. In this case I am not sure that the paraffin shifted, as I am of the opinion that I injected a column of paraffin along the ala of the nose to see if it would not aid in overcoming a relaxed ala. Of course paraffin may shift, but it has been clearly demonstrated by experiment upon animals that hard paraffin will create a fibrosis around the mass, while a soft paraffin will gravitate through the areolar tissue. To lessen the danger of shifting, inject the paraffin cold, as the nearer it approaches a discrete mass the more readily will a fibrosis form around it.

Keloid.—E. Fletcher Ingals of Chicago writes me that he considers the injection of paraffin dangerous owing to the danger of death, and to the fact that there have been at least eight cases of keloid following its injection. There is no doubt that a fibrosis is set up by paraffin injections, varying in intensity with the hardness of the paraffin. A paraffin melting at 155° F. would tend to produce as much fibrosis as a plate of hard rubber or celluloid. Keloid has never occurred where lower melting points have been used, so far as I know. I can see no reason why keloid should form when a paraffin of 115° F. melting point is used. I have never seen a case, and have never heard of a case occurring in the experience of any of my co-workers. Dr. Ingals tells me that these cases did not come under his personal observation.

Carcinoma.—Dr. R. Bishop Canfield of Ann Arbor, Mich., has given me by letter the only report of a case of this nature in any way connected with paraffin injection. The case is of sufficient interest for me to give it in full:

"In connection with your paper you will be interested in the following case which presented itself at my clinic some weeks ago. A young boy, 17 years old, in whom nothing suggestive of syphilis could be discovered, with a history of having had a marked deformity of the nose corrected with paraffin some months before, showed a nose about twice the size of the normal, rounded on all sides and almost shapeless, red in color and giving the impression when palpated of being very dense. In both very hot and very cold weather it was bright red with dusky blue red spots. The patient said he knew that paraffin melting at 110° F. had been used, and that the nose was somewhat larger and redder now than it was some two or three weeks after the injections. It was so mortifying to the patient and was so dense that I determined to try to dissect some of the paraffin out. I neglected to say that the entire septum was about half an inch thick, and apparently filled with paraffin. I made a free incision into the skin over the area of greatest density, first on one side and then on the other, in the hope that I might be able to express out a little of the paraffin, but was unable to do so. The tissue *bled* very freely from all the cut surfaces. I removed pieces for microscopical examination. After the incisions healed there was, to my surprise, considerable improvement in color, which was decidedly less red than before, due, no doubt, to decrease in pressure following removal of the pieces of tissue. Microscopical examination by Dr. Warthin shows the perfect picture of squamous carcinoma. I have not seen the patient since a week after the operation. He has promised to return if the nose increases in size. If he does, I will let you know how he is."

In view of the fact that this patient's septum was filled with paraffin, it is reasonable to suppose that some growth existed before the paraffin was injected. I believe the new growth in this case was a coincident, and that the cancer was not the result of paraffin, but was possibly the cause of the condition for which the paraffin was used.

Advantages Over Other Surgical Measures.—Paraffin injected under proper surgical conditions and with the precautions advised in the preceding paragraphs will remain in the tissues and serve its purpose far better than the surgical introduction of silver, aluminum, or hard rubber plates, which invariably slough out. In the correction of nasal deformity by breaking up the nasal bones and breaking away the nasal processes of the superior maxilla to aid in forming the bridge, there is ordinarily too little septum to give the necessary support to insure a permanent structure, and the seriousness of this procedure, with the necessary sojourn of the patient in the hospital, is a question which frequently determines the patient against the operation. Neither a general nor a local anesthetic is necessary in the injection of paraffin, and the patient may continue his work without scar or discomfort.

The history of the following case demonstrates the superiority of paraffin injections over the surgical insertion of silver or celluloid plates for the restoration of nasal deformities.

The patient, Mrs. N., was referred to me by Dr. George E. Brewer, August 7, 1907. She was 37 years old, and when a child her nose was broken. An abscess of the septum followed, which resulted in loss of the septum and a saddle-back nose. Fourteen years ago she consulted Dr. W. T. Bull, who inserted a silver plate for the restoration of the bridge. This plate remained in situ for three years and gave satisfaction. At the end of this period inflammatory conditions began, which soon resulted in the extrusion of the plate. The patient then consulted Dr. Robert Weir, who inserted a celluloid plate, which came out in six weeks. Examination on entrance to the Manhattan Eye, Ear and Throat Hospital showed complete loss of all the cartilaginous septum,

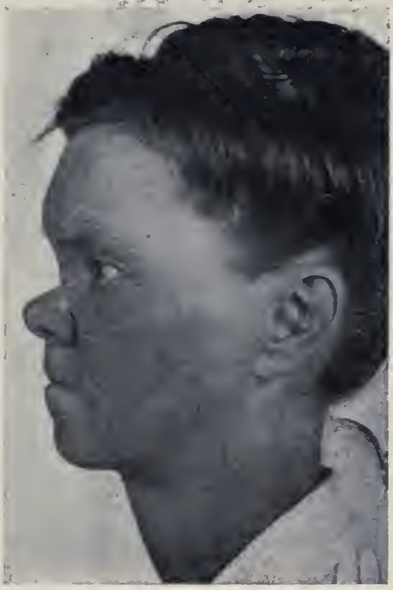

Figure 5. Side view, showing marked depression. Before injecting paraffin.

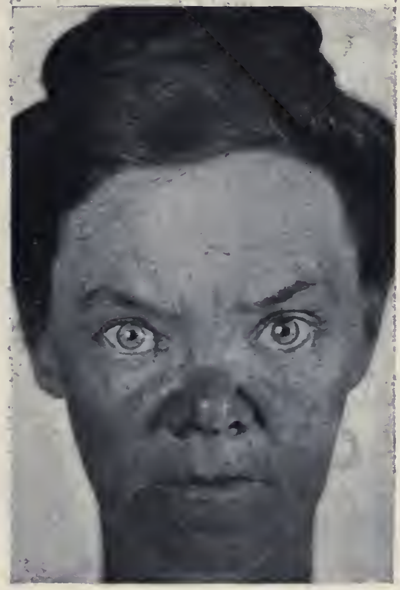

Figure 6. Front view. Before injection.

nearly complete atresia of both vestibules, and marked saddle-back nose, with adhesions and cicatrices binding the skin close to the bones. My attention was directed first to the atresia, which was satisfactorily overcome by January 2, 1908, after the removal of nearly all the scar tissue in each vestibule, and the insertion of hollow splints for five months. I made the first injection of paraffin on the above date, and a subsequent injection two weeks later. The first injection was followed by no reaction whatever, but the second was followed by some edema under the eyes, and redness and swelling over the nose—all of which finally subsided, and the result was obtained as seen in the photographs (figures 7 and 8).

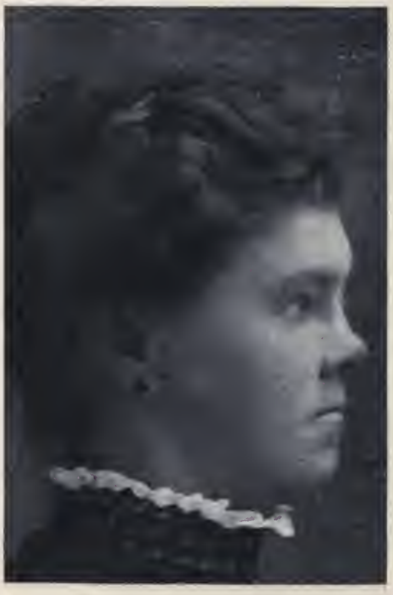

Figure 7. After injection.

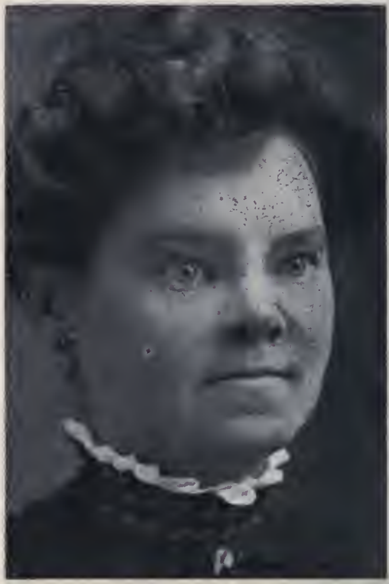

Figure 8. After injection.

Deductions from Statistics.—

Total number of cases reported by forty-one different observers, not including my own—1,252.

Of this number:

1,000 were entirely successful.

104 were unsatisfactory.

2 of the 104 cases resulted in blindness.

55 of the 104 cases resulted in sepsis and extrusion of the paraffin.

In 22 of the 104 cases the paraffin lodged in the wrong location.

In 7 of the 104 cases the paraffin shifted after operation.*

The instruments used were ordinary hypodermic syringes, Killian's, Beck's, Pfau's, Broeckaert's and Smith's. The paraffin injected varied in melting point from 103° to 136° F., the majority using a paraffin melting at 110° F., and with the proportions originally suggested by the writer. The precautions against the distribution of the paraffin in undesirable localities were digital pressure and plates of lead and steel.

Thirty-one of the forty-one operators consider the procedure practical if proper precautions are observed, and if performed by an experienced operator. The other ten consider it dangerous, and in most cases unwarrantable. I have tabulated, as far as I could, the replies to my circular letter, and submit the result to you for closer scrutiny. I have given the names of those signing the letter, as I presume they gave consent to using their names by so doing. Those who did not sign may recognize their own statistics with their names left out.

Conclusions.—This operation is not without its dangers, which, however, now that we know of them, can be avoided. It is a practical procedure when performed by one of experience and with thorough surgical precautions.

The proper paraffin is one with a melting point of about 115° F. and made of hard and soft paraffin. The mixture must be injected cold, and the needle directed from above downward. The upper part of the nose must be protected by the digital pressure of an assistant, and the injection must be made slowly, and only in small quantities at each sitting. The second injection should not be made shortly after the first, but ample time should be given the tissues to regain their normal vitality before injecting more material.

Cold compresses after the injection favor the anchorage of the paraffin, and a collodion dressing over the entrance of the needle is a precaution against infection.

No syphilitic, diabetic, nor nephritic patient should be injected without due consideration to what has already been said; and, lastly, no attempt should be made to inject cold paraffin except with a screw syringe or with one of the ratchet injectors.

No. 44 West Forty-Ninth Street.

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*These figures will not sum up correctly, as some of the operators gave only their number of unsuccessful cases and omitted their total number of cases operated upon.

THE REPAIR OF HARE-LIP AND CLEFT PALATE.*

BY J. F. BARNHILL, M. D., INDIANAPOLIS.

The repair of hare-lip and cleft palate has heretofore been largely left to dentists and the general surgeon, chiefly, no doubt, for the reason that, as laryngology and rhinology developed to its present state in a comparatively short time, those who practiced these specialties have been kept sufficiently busy in perfecting operative procedures which have seemed more intimately connected with these fields. Moreover, only recently the specialist in diseases of the upper air tract was presumed to be more of a therapeutist than a surgeon, his training was usually not that of a surgeon, and hence, he was not often capable of successfully carrying out the complete and often difficult details of the surgical steps necessary to the closure of these congenital defects.

At the present time, however, when many of the problems connected with both the surgical and medical aspects of the diseases of the upper respiratory tract are more or less settled questions, and when many who limit their practice to these diseases have found that they must, of necessity, be surgeons, and have accordingly received ample training in the principles and art of modern surgery, the occasion seems now at hand for the laryngologist and rhinologist to claim his own, and to undertake this class of work, which, in the main, is less difficult than much of that which he is already doing. The repair of hare-lip and cleft palate should be included in the practice of laryngology and rhinology for the following reasons: 1st. The defects involve the structures of the upper air tract, often converting the mouth, nose and naso-pharynx into one cavity. 2nd. Voice production, or, at least, normal speech, is always greatly impaired. 3rd. The repair of the clefts involves the restoration of the nose and soft and hard palate to as nearly the normal as possible and in doing this the muscles of the soft palate and those which to a great extent regulate the patency of the Eustachian tube, are involved in the surgical repair. 4th. No one is presumed to have a better knowledge of all these structures and their functions than the laryngologist, and no one should be better able than he who is thoroughly trained to work in such cavities to carry out the delicate technic necessary to success.

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*Symposium paper presented at the 14th Annual Meeting of the American Laryngological, Rhinological and Otological Society at Pittsburg, May 29, 1908.

Statistics concerning the frequency of hare-lip and cleft palate vary somewhat, but an average seems as follows: One cleft palate in about every 5,000, and one hare-lip in about every 2,500 infants. Hence these affections are the most common of the congenital defects of the lip and mouth. The cause is a failure of union on the part of the several embryonic processes necessary to perfect development. The reasons for such failure to unite assigned by various writers are heredity, maternal impressions, and maternal disease and malnutrition. Arrest in the embryonic development of the embryonic structures concerned is often assigned as the cause of the cleft, but Brophy maintains that the parts are fully developed and that the cleft is solely the result of their failure to properly coalesce.

Time for Operation. Most surgeons now agree with Lane, Brophy and Ferguson that the best time to operate is soon after the birth of the child, many preferring to do so, especially when the defect is only a hare-lip, on the day following birth. Of course, should the infant be badly nourished, or in some other way affected, it would bear any operation badly and the procedure should be delayed until the causes calling for the delay have been remedied. If at birth the child is plump and well in every way, except the hare-lip or hare-lip and cleft palate, operation at this time is best, for if postponed the child will probably be found in a less satisfactory condition very soon for the reason that its defects prevent in a marked way its proper nourishment. Should the child have approached the age of dentition before consultation with the surgeon, it is wise to allow the teeth to erupt before the procedure for closing the gaps is undertaken, although infancy is the proper time to operate for the reason that at this age not only can the gaps be properly closed, but by doing so at this time the chances in favor of better phonation and satisfactory speech are greatly favored. Nevertheless, should operation be refused or neglected in early life, and the patient be seen in youth or adolescence, good cosmetic effects are often obtained, even though but little improvement in speech is possible and operation should not, therefore, be refused at any age.

The operations for hare-lip and cleft palate can be best described separately.

I. Hare-lip.

This defect may be single or double, and may or may not be complicated by cleft palate. The lip defect may amount to only a small notch, which is scarcely noticeable, or it may extend into the nostril, and involve the alveolar process and superior maxilla toward and rarely even to the orbit. When the defect is double, the intermaxillary portion of the alveolus covered by rudimentary portion of lip projects forward at a varying angle to the natural plane of the alveolar arch, to which in some cases it is attached at almost a right angle to the tip of the nose, and anterior septal margin.

The plan of operation in any case must always depend upon the nature and extent of the defect. Each case should therefore be carefully considered upon its own necessities. In case an incomplete notch only is present, the operation for its correction is simple, and Nelaton's method of procedure can be successfully followed. This consists in transfixing the lip parallel to the mucocutaneous border of the notch for a distance dependent upon the depth of the defect, and at a distance from this border of from one-quarter to one-third of an inch. The lower portion of the incision is then pulled downward into a normal position when retention sutures are inserted.

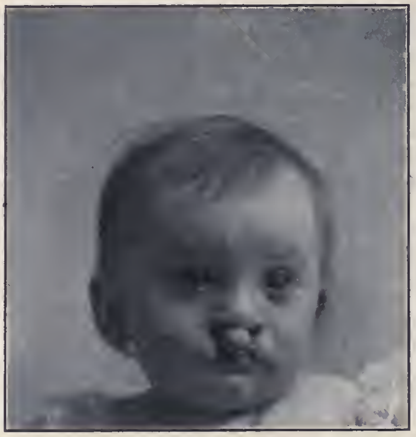


Figure 1. Child, age one year. Double hare-lip with projecting intermaxillary bone.

When a single fissure extends up to, or into the nostril, either a unilateral or bilateral tongue-shaped flap may be cut from each lip, the plan to be followed depending upon the amount of tissue which is missing. The question of the number of flaps, their width and length, is a question in all cases to be settled by the operator at the time of operation. The principle should always be followed of utilizing all the tissues that remain, to the end that as little subsequent tension as possible will be exerted on the retention sutures. In this respect Ferguson's plan of turning back flaps of mucous membrane from the upper three-fourths of the cleft, first uniting these, and then suturing the lip-margins is most excellent.

In cases of double hare-lip with intermaxillary projection which stands at right angles to the normal alveolus, and which is adherent to the tip of the nose, it is necessary to deal with such projection by a preliminary operation in which the misplaced part is dissected loose from the nose, and its osseous junction with the superior maxilla is fractured to such an extent as to permit its replacement in a position corresponding with the normal alveolar arch.

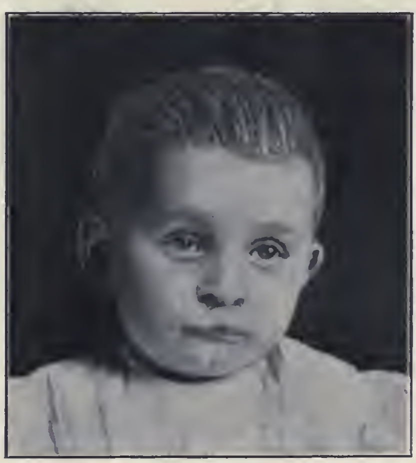


Figure 2. Same as figure 1, three months later, and after operation.

In addition to this it is best to freshen the adjacent edges of both the replaced intermaxillary process and the alveolar arch, and to approximate the same by means of silver wire sutures. Two weeks or more may then be allowed before the hare-lip is repaired. I know of no condition that would justify the complete removal of the intermaxillary portion, although this is advocated in several standard works on surgery. In case the deficiency extends into one or both nostrils, and as a result the cartilaginous wings are distorted and detached from the septum, the plastic repair must include the careful restoration of the same by their approximation and retention to their normal relation to the nasal septum. Sometimes this requires the resection of a portion of the cartilage in order to secure a proper contour of the nostril. In shaping the nostril much assistance may be had by using a sound or bougie, over which each nostril wing is moulded and secured.

The failures resulting from repair of hare-lip are due, 1st, to malnutrition of the patient; 2nd, to improperly prepared or badly adjusted flaps, and 3rd, to too great tension on the sutures resulting from facial movements, or to the fact that the sutured portions of the lip were drawn into position without sufficiently releasing the attachment of the lip to the alveolar processes. The first and second of the above reasons for failure always involve the judgment of the operator, and do not, therefore, need discussion here. In every operation for hare-lip the amount of tension necessary to bring the separated portions of the lip together should always be tested, while the patient's face is in absolute repose, and unless the parts fall together quite readily and naturally, a small knife or a straight, sharp scissors should be thrust through the mucous membrane of the lip at its junction with the alveolus and the labio-alveolar separation accomplished through the smallest possible incision. Facial movements may be controlled, and the operated part put at complete rest by carrying a strip of adhesive plaster three-quarters of an inch wide over the line of in-

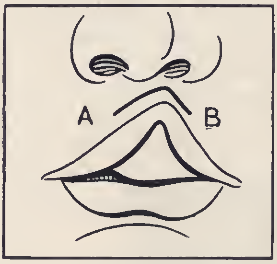


Figure 3. Nelaton operation. AB, line of incision through lip.

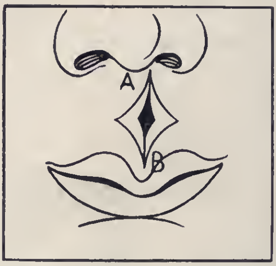


Figure 4. Nelaton operation; lip depressed, line AB thrown vertical.

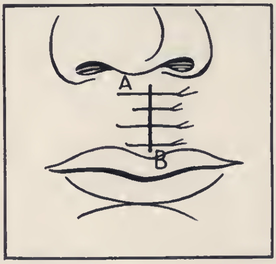


Figure 5. Nelaton operation, suture inserted.

cision from one cheek to the other. Since this often becomes quickly soiled from nasal and mouth discharges, and requires frequent changing, much annoyance and pain are produced by necessary changes. An appliance which I have seen used successfully, and which I have employed myself with satisfaction, is that of H. R. Allen, which is made from a watch spring, and sets upon feet which are broad enough to distribute the pressure from the spring over a sufficient area on each side to entirely relieve all tension upon the sutures. A chief value of the device is that dressings may be made for any necessary length of time without the slightest necessity of changing the instrument. (See figures 9 and 10.)

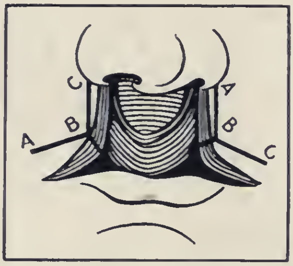


Figure 6. Operation for double hare-lip. ABC, lines of incision for making flap.

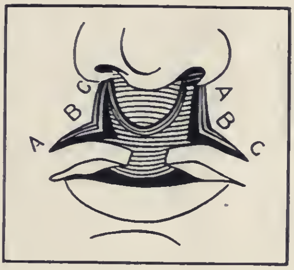


Figure 7. Double hare-lip. Construction of flaps.

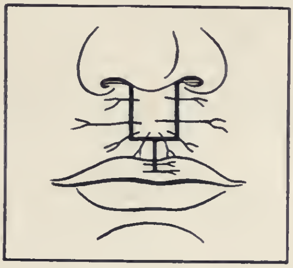


Figure 8. Double hare-lip. Flaps, adjuster and sutures in place.

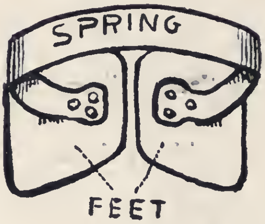
II. *Cleft Palate.*

Operative measures directed to the closure of cleft palate are more severe than those for the repair of hare-lip. The difficulties attending the performance of the former are greatly multiplied in comparison to the latter. Surgical anatomy, the mechanics of surgery and a thoroughly known surgical technic are necessary acquirements on the part of the surgeon.

Choice of Time for Operation.

It was formerly thought advisable not to operate for cleft palate before the age of two years.* Most operators at the present time prefer operation during early infancy. Brophy, whose experience entitles him to speak with authority, states that the best age to select is within three months from birth, and he frequently closes the defect as early as the tenth day.

Briefly stated, his reasons for early closure are as follows: 1. The surgical shock is less. 2. The bones of the face at birth are pliable and malpositions may then be more easily corrected. 3. The earlier the correction of the defect, and therefore the earlier that the mucous and muscular structures are put into their new and more normal positions, the better will be the results as to voice and speech. 4. A more normal shape and position of the superior maxillae, and especially of the alveolar process is established by early closure.



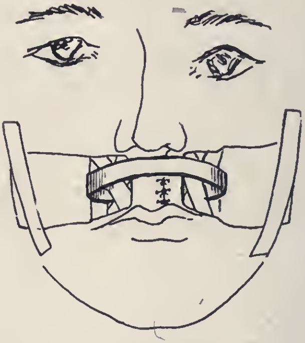


Figure 9. Allen's hare-lip spring. The feet are pulled apart before applying to the operated lip. The pressure of the spring holds the sutured parts snugly together till healing takes place.

Figure 10. Allen's hare-lip spring applied, showing adhesive plaster fastenings. Antiseptic gauzes are readily applied between the lip and spring, and these can be changed as often as necessary without in any way disturbing the wound.

Technic of the Operation.

This depends greatly on the age of the patient at the time the closure is undertaken. When the child is seen at birth, or during the first three months following, I believe the plan of procedure advocated by Brophy is best. This operator has shown to my own satisfaction that the cleft in the palate is not due, as usually stated, to an *arrest* in development, and a consequent *deficiency* of tissues, but that the fissure occurs as the sole result of the failure of the two sides *to unite,* even though sufficient material is present. The failure, therefore, being one of lack of union, the logical procedure would seem to be one of bringing the two sides of the head into apposition and of anchoring them there until union takes place. This Brophy accomplishes by the following steps:

---

*Augenbach and Trelat preferred operating at seven years. Roux believed operation should be delayed as late as sixteen years. Kirmisson, of Paris, does not state an exact age of choice, but indicates that it should not be done during the early years of childhood.

The infant is prepared by cleansing the mouth with antiseptic washes. Chloroform is administered through the tube of a special device. A mouth gag is inserted. (See Figs. 11, 12 and 13 for the several instruments necessary to this operation.) The edges of the cleft are denuded, including a shaving from the bone, if thought necessary. The cheek of one side is then retracted, and a specially devised needle which is threaded with braided silk is inserted into the alveolar process from the outside, at a point near the posterior margin of the hard palate, and on a level with the horizontal table of the palate bone. It is thence pushed inwardly through the substance of this plate until the point emerges in the central cleft and the silk braid is released. This same procedure is repeated on

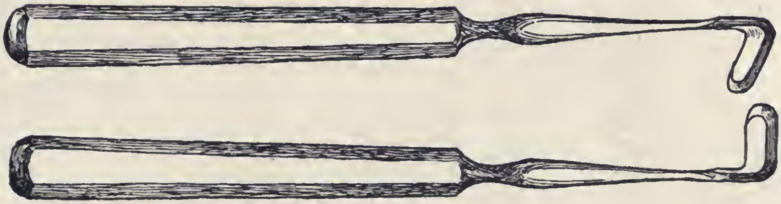


Figure 11. Brophy's curved periosteotomes used in the elevation of the soft tissue of the hard palate. There are a number of these instruments, varying from a right angle to the acute angle shown in the drawing.

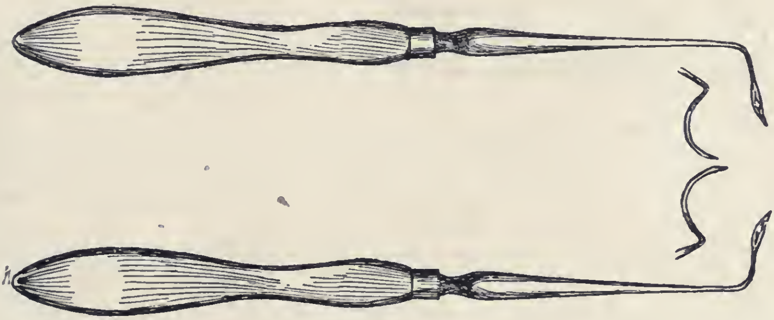


Figure 12. Deschamp's needles used in the introduction of tension sutures.

the opposite side. By attaching one of the silk threads to the other in the cleft, a single thread is drawn from the exterior of the alveolus on one side, through the intervening bone, across the cleft, to the opposite side. A No. 20 silver wire is then attached to the silk thread and drawn through to the opposite side, thus substituting the silver for the silk sutures. Near the front of the alveolus a second wire is passed from side to side in an exactly similar manner as the first, only that the wire is carried above, and not through, the bony structure of the hard palate.

In order to prevent these silver sutures from cutting out, two lead plates, one for each side of the alveolar process, are shaped to fit the respective processes they are to cover, are perforated by two eyelets which are the same distance apart as are the two wires at the point of emergence, and through these the wires are passed, drawn tightly, and twisted one to the other. The lead plates are well tolerated, and effectively prevent the wires cutting through the alveoli. Force applied by means of a specially devised clamp may be necessary to approximate the two lateral halves of the jaw during the twisting of the wire sutures.

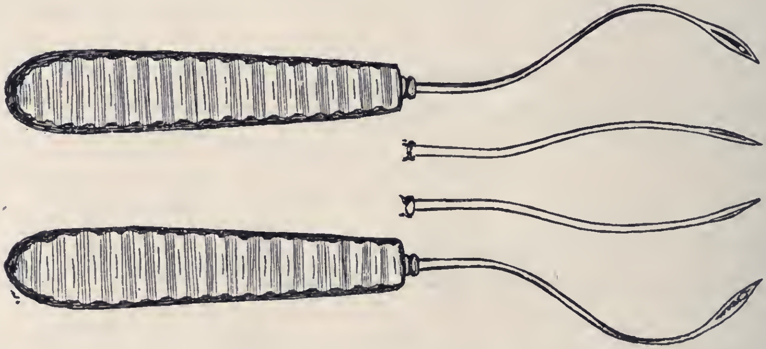


Figure 13. Brophy's strong needles used in the introduction of silver tension sutures through the maxillary bones.

In case there is a wide gap between the margins of the palate bones and the structures to be approximated are unduly resisting to the tension of the wires, it may be necessary to cut through each malar process. If this be done, the bone should be severed through a small submucous incision, since otherwise the fractured alveolus would be inefficiently supported, and might be readily displaced into a malposition.

The line of approximation of the two mucous edges of the cleft should be examined on the oral surface, and should they not lie in perfect apposition any required number of fine silk sutures may be inserted before considering the operation finished.

In operations performed on infants having both hare-lip and cleft palate, the palate should be repaired first, for the reason that the extra space given to the mouth on account of the lip defect aids greatly in carrying out the necessary steps of the palate operation.

Operation on Cases More Than Three Months Old.

In the event that the individual has passed the age when it is longer possible to approximate the two lateral halves of the superior maxilla, as just described, some form of flap closure is usually to be chosen, and from the many plans advocated by various operators I have employed the one known as the Davies-Colley operation. One of the chief difficulties in any plan of procedure is to overcome the tension upon the sutures during the time required for union of the fissured structures, and the method suggested by this surgeon overcomes this as well or better than any other I have tried.

The operation consists in the dissection, from the palatal surfaces, of three flaps, and of making one incision. It is sometimes called the double-door operation, for the reason that two of the flaps swing together on hinges from the whole distance of the marginal clefts. These flaps are so turned and permanently fixed during the operation that the upper surface of the whole cleft is covered by mucous membrane taken from the oral surface of the palate, and the oral surface of the cleft is reinforced and greatly strengthened by a large muco-periosteal flap which is turned across the cleft with its mucous surface looking downward. This arrangement brings the periosteal surfaces of all the flaps into direct apposition with each other, and in these osteoblasts form, and a more nearly normal palate may be expected. Moreover, the pressure of the patient's tongue against the roof of the mouth, which will be more or less firm after any operation, will, in this one only, press the two raw surfaces more firmly together, and will, therefore, favor rather than hinder the reparative process.

Descriptions of operations like this are worthless and I therefore refer to the figures. The steps are, 1st, an incision A B close to the alveolus, and with its center at the last molar tooth. The incision is made down to the bone over the hard palate, and transfixes the soft palate for a distance dependent somewhat upon the width of the cleft. The tensor palati and levator palati muscles of one side are, of course, divided by this incision. An incision is then started at C, and is carried downward on the same side about one-quarter on an inch from the border of the cleft through the length of the hard palate, but as the posterior border of the hard palate is reached, the incision is brought to the margin of the cleft, whence it is continued in such way as to simply divide the two surfaces of the soft palate and uvula, the incision finally ending at D. Another incision is begun at F on the opposite side and continued along the border of the cleft of that side at a distance of one-sixth to one-fourth inch, until the posterior edge of the hard palate is reached, at which point the cut is brought to the edge of the cleft, and continues as a splitting incision of the anterior and posterior mucous surfaces ending at G. A fourth incision is begun at E and continued to F, thus completing the outline for the third muco-periosteal flap.

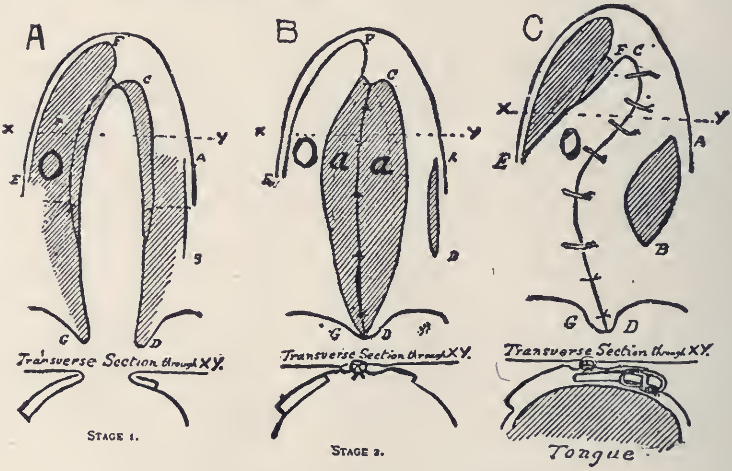

A
F
C
X
Y
O
E
A
B
G
D
Transverse Section through XY.
Stage 1.
B
F
C
X
Y
O
a
a
E
A
B
G
D
Transverse Section through XY.
Stage 2.
C
F
C
X
Y
E
O
A
B
G
D
Transverse Section through XY.
Tongue

Figure 14. Davies-Colley Operation.

2nd. The next step of the operation consists in the elevation of all these flaps. By means of one or more elevators of suitable size and curve, the flaps are loosened from the bone over all the shaded areas shown in Fig. 14, A.

3rd. The two marginal flaps are then turned toward each other and sutured as shown in Fig 14, B. This accomplished, flap O is turned across the field of the sutured flaps a a, and is sutured into the position shown in Fig. 14, C. In order to relieve any undue tension that may be found present at the time of introducing the sutures, it may be found necessary to lengthen incisions A B, or to carry the incision at E to a lower point, and to elevate the mucoperiosteum over a greater area. The suture material may be ten day chromic catgut, silk or wire, according to the preference of the operator. Davies-Colley recommends fine silver wire.

The after treatment is much the same following any plan of operation. The mouth and line of sutures should be gently sprayed with normal salt solution several times a day. The nourishment should receive very great care. The child should be given its milk from a spoon, and not from the nipple of a nursing bottle; which would likely disturb the sutures. The child should be kept in the open air and sunshine if the weather will permit, and if not, the ventilation should be the best possible to secure. Provision must be made for preventing the infant cramming its fingers or hands into its mouth.

Results.

If the operation for hare-lip and cleft palate prove entirely successful two benefits should be noted, viz.: The marked change of feature and an improvement in voice and speech. The former is, of course, immediate, while the degree of benefit to the voice and speech can only be estimated as the child acquires a knowledge of spoken words. As a rule, the earlier the operation for cleft palate is performed, and the smaller the amount of injury done to the palatal muscles during the operation, the better will the voice be. Following operations in adult life, especially if the palatal muscles have been severed, and much thickening and scar tissue of the soft palate results, very little good will result to the defective speech. Early operations, and plans of operating which will not interfere with muscular action are, therefore, always to be advocated.

No. 323 North Delaware Street.

THE COSMETIC AND PLASTIC SURGERY OF THE EAR.*

BY M. A. GOLDSTEIN, M. D., ST. LOUIS.

Cosmetic surgery, employed in the correction of deformities or abnormalities of the external organs of the head, is a comparatively new field of work to which the oto-laryngologist has, as yet, contributed but little of his time, talent or technical skill.

This department of surgery has been for the greater part in the hands of the "advertising specialist" and "beauty doctor." The work of correcting featureal defects or deformities has received but little legitimate recognition in the nomenclature of classic surgery, nor has the necessity for such surgery been deemed sufficiently justifiable to engage the serious attention of the busy surgeon. A markedly crooked nose, or an irregularly enlarged ear, may not seriously handicap the functions or utility of the general economy, but the patient may be just as sensitive and conscious of such a defect and anxious for its correction as he would be to have a genuvarum straightened by the orthopedist, or a strabismus corrected by the ophthalmologist. This form of surgery is dignified, delicate and justifiable, and may call into service all the skill and technical ability at the command of the surgeon.

There are many forms and variations of the surgical technique employed in this work; the operations may be performed without serious inconvenience to the patient, and in most instances without a general anesthetic; complications and serious sequelae should be of very rare occurrence if the usual aseptic and surgical precautions are observed; the ultimate results are gratifying both to the patient and to the operator.

The correction of defects of the nose and ear is distinctly within the province of the oto-laryngologist, and it is our opinion that we may confer an additional boon on humanity by wresting cosmetic surgery from the hands of the quacks, where it has seemed to flourish until now, and giving it a legitimate place in our earnest considerations and active work.

I have classified cosmetic and plastic surgery of the ear in three subdivisions:

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*Symposium paper presented at the 14th Annual Meeting of the American Laryngological, Rhinological and Otological Society at Pittsburgh, May 29, 1908.

(*a*) *The correction of defects and deformities of the external ear,* including the many abnormalities and congenital stigmata to which the human auricle is heir.

(*b*) *A discussion of the plastic technique, following the radical mastoid operation,* with special reference to the operative details in the formation of the various flaps, and a comparison of the special advantages of each of these plastics.

(*c*) *The correction and closure of persistent retro-auricular openings* following the radical operation, and a consideration of the various methods to perform such plastic.

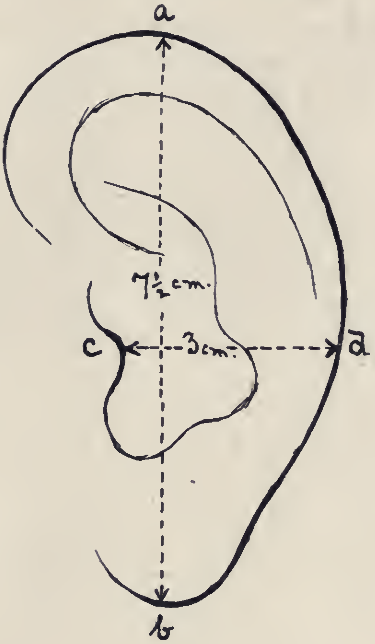


Figure 1.

Diagrammatic representation of normal ear measurements.

There is perhaps no part of the human anatomy that is subject to greater variation in size, shape, and development than the external ear; to even the casual observer a considerable abnormality in the size and shape of the auricle may make a definite impression of disfigurement. It may be impossibie, therefore, to create any standard for a normal ear, or to empirically specify to what extent the deviation from such standard may take place without justifying surgical intervention. Until the technique of correcting deformities of the external ear is more accurately developed, and until this field of plastic surgery gains greater favor with the otologists, it may be well to confine our efforts and energies to the correction of those aural abnormalities where conspicuous deformity exists, and where the patient desires such correction because of the many personal embarrassments and comments to which such deformity may subject him.

An empirical standard may be established by measurements of the long and short axes of a large number of normal-shaped ears. The long axis should be measured from the most dependent part of the lobule to the crest of the helix, as indicated in line *a b,* Figure 1. The short axis is taken from the inner curve of the tragus to the arc of the helix at right angles of line *a b* to line *c d,* Figure 1.

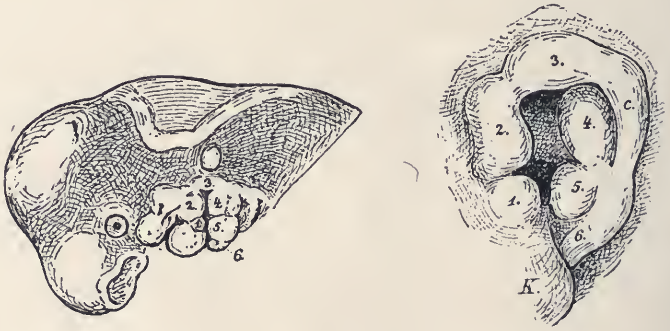


Figure 2.

Head of Human Embryo (His). Above the first branchial cleft lies the ear vesicle. Surrounding this cleft are the six tubercles of which the external ear is formed.

Human Embryo (His) showing the six tubercles of which the several parts of the external ear are formed. 1. Tragus. 2 and 3, Helix. 4, Anti-helix. 5, Anti-tragus. 6, Lobule. K. Inferior Maxilla.

These measurements are expressed in an average of a large series of ears as follows:

Long axis, or length of ear, 7 ½ cm. (3 inches); short axis, or width of ear, 3 cm. (1¼ inches.)

In the long axis all measurements exceeding three inches, or less than two inches, indicate an abnormal measurement. In the short axis a width of less than one inch, or of more than one and a half inches, is regarded as abnormal.

Aural embryology offers the first evidence of the great variation in the construction of the external ear. Minot states that "before the end of the first month there appears around the external opening of the first gill-cleft a series of six tubercles, two in front on the hind edge of the first visceral arch, one above the cleft and three behind it. A little later a vertical furrow appears down the middle of the hyoid arch in such a way as to mark off a little ridge, which joins on to tubercle 3, and descends behind tubercles 4 and 5. The second stage is reached by the growth of all the parts; diffusion of tubercles 2 and 3, and the growth of the ridge down behind tubercle 5, to become continuous with tubercle 6. After these changes it is not difficult to identify the parts.

"Tubercle 1 is a tragus; 2 and 3, together with the arching ridge, represent the helix; 4, the antihelix; 5, the antitragus; and 6, the lobule; the pit between the tubercles, the fossa-angularis. During the latter part of the second month the ear changes in its proportion somewhat in the irregular development.

"The third stage begins at the third month; the upper and posterior part of the concha arises from the surface of the head and gradually but rapidly bends over forward, so as to completely cover the antihelix and the upper portion of the fossa-angularis. During this stage in mammals the assumption of the pointed form of the ear commences.

"The fourth stage commences at the fourth month, when the tubercles, which are now joined together by cartilages, commence to unfold and are complete by the fifth month. Finally the sixth tubercle develops to form the lobule."

Talbot, in his excellent monograph, "The Degenerate Ear," expresses the relation of embryologic development to aural deformities very tersely and clearly, as follows:

"This unfolding or development of the tubercles to produce the different portions of the ear and make it complete is not unlike the development of a flower from the bud. By this process may be understood how, if by malnutrition in one tubercle, or bud or another, or should there be a larger supply of nutriment in one than another, malformation of the ear would result. If an arrested development of all the tubercles should take place at any period from the first to the fifth month of foetal life, the ear would resemble a semi-developed flower."

The anomalies of form to which the external ear is liable have been the subject of considerable anthropological research, and the impetus to this research was given by the keen observations and accurate conclusions of the eminent Italian criminologist and anthropologist, Lombroso.

About fifteen years ago Gradenigo created additional interest from an otological point of view, by the publication of his classic. anthropological studies, "Ueber die Formanomalien der Ohrmuschel."

The most conspicuous of the anomalies as classified by Gradenigo are:

1. Macrotia and Asymmetry of the Auricle. Where the distinct variation in size and shape of the two auricles in the same patient exists, it has been found, with but few exceptions, that such asymmetry is associated with facial asymmetry. In this subdivision of asymmetry of the auricle will be found a large proportion of the cases that come under our observation for legitimate correction.

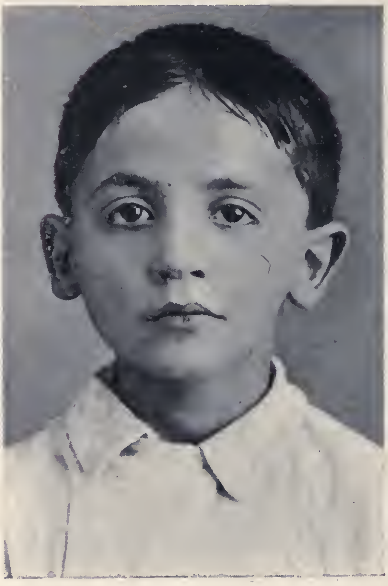


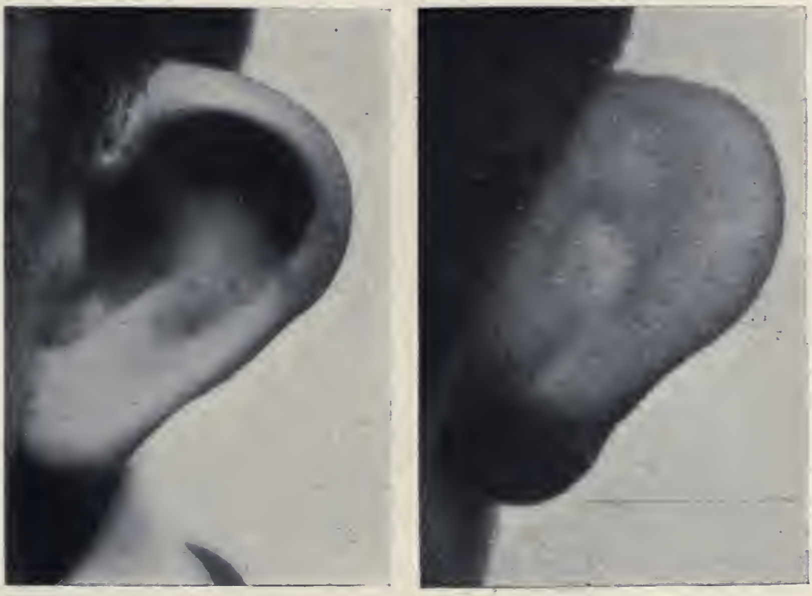
Figure 3.

Asymmetry of the Auricle.

2. Heterotopy. Cases of misplacement, displacement and abnormal insertion of the auricle are rare, and are to be found only in the most marked deviations of embryologic development and especially in certain monstrosities known as otocephali. A number

of the earlier writers have reported such remarkable cases; Sebenicius reports an auricle inserted on the neck; Wolf, a case inserted on the shoulder; and Phelitz and Stark, an auricle located on the cheek. This class of cases is hardly to be considered within the field of plastic surgery, unless it were possible in these rare instances to transpose the auricle entirely to its proper position.

3. Adhesion of the posterior surface of the auricle, in whole or in part, to the head. These conditions, as anomalies, are extremely rare, and find no definite embryologic significance.



Anterior View. Posterior View.

Figure 4.

Projecting Auricle.

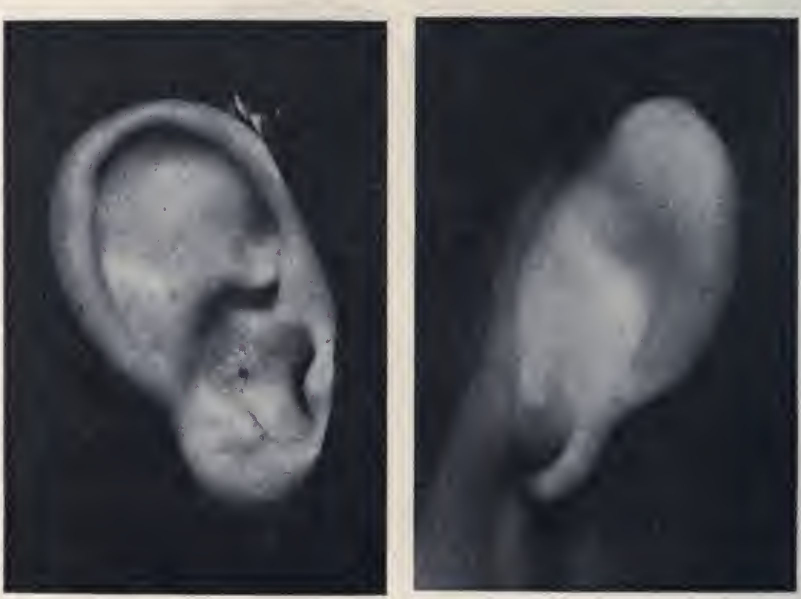
4. Projecting auricle. (Prominent ear.) The auriculo-temporal angle, as observed by Frigario, measured between the side of the head and the posterior surface of the auricle, is an acute angle in the normal ear. When, however, the auricle stands at right angles, or in even more exaggerated forms at an obtuse angle, it assumes the characteristic appearance known as the projecting or prominent ear. This abnormality of position is perhaps the most frequently observed of all deformities of the external ear, and has both an important embryologic and anthropologic significance.

When the ear is thus unduly prominent, especially when observed in early youth, its surgical correction is simple, the result satisfactory, and the patient saved much embarrassment. This deformity predominates in men.

5. The pointed ear. (The Darwin tubercle and the Satyr point.)

The Darwin tubercle results from an incomplete involution of the helix; the Satyr point occurs in quite a similar manner on the superior border of the helix.

When either of these deformity areas of the helix is marked they may be promptly corrected by a slight plastic on the posterior surface of the helix, and the resection of a narrow wedge of skin; if necessary, even the projecting portion of cartilage may be pared off subdermally.



Anterior View. Posterior View.

Figure 5.

Absence of Antihelix, Projecting Ear and Redundancy of Concha Cartilage.

6. The Macacus ear. (Also known as Darwin ear.)

In this deformity there is a flattened or imperfectly defined helix, or there may be even an absence of a section of the helix.

7. Wildermuth ear. (Prominence of the antihelix.)

The antihelix may develop so prominently that it may overshadow the helix when the auricle is seen in profile, and the ear assumes a characteristic aspect. This anomaly has been observed more frequently in the female. In this malformation there is an exaggerated absence of the normal shell-like concavity of the concha and pinna. In this form the anterior surface of the auricle appears flat, and in some cases the anterior surface is even convex.

8. Absence of the helix.

This condition is extremely rare, and would offer but little practical opportunity for plastic, for when there is a distinct absence of this delicately formed cartilage of the helix, antihelix or tragus, it is a difficult surgical task to shape one, or to construct it from other or adjoining tissues.

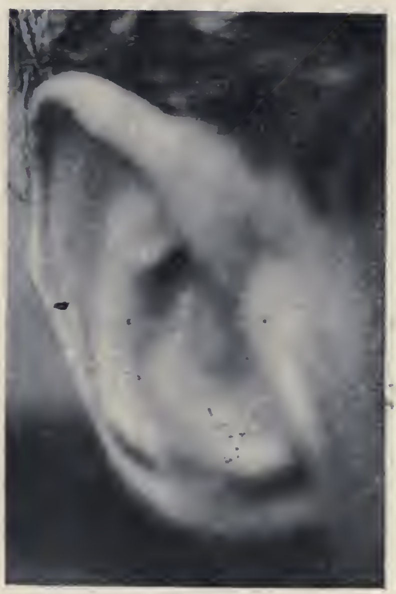


Figure 6.

Darwin Tubercle; Satyr Point.

9. Absence or exaggerated development of the lobule.

It is a well-known observation that deformities of the lobule are conspicuous and apparent even to the laity. Complete absence of the lobule is not infrequent, and produces a very characteristic appearance of the ear. In this class of cases the cartilage is distinctly bound round by integument, and the familiar pendent portion, comprising the lobule, is absent. Exaggerated development of the lobule, either in length, in breadth or in thickness, is occasionally met with, and in such marked degree that a correction of this deformity offers a grateful field for plastic surgery.

10. Adhesion of the lobule. (Synechia.)

When the adhesion of the lobule is symmetrical, and the area of the external ear comparatively normal in appearance, it does not offer a conspicuous abnormality, but when there is a synechia of one lobule and the other lobule is normal, there is justification for its surgical correction.

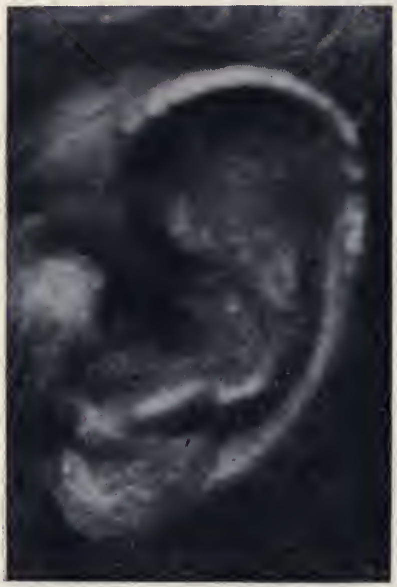


Figure 7.

Macacus Ear; Darwin Ear.

This classification is a comprehensive one, and includes the major deformities to which the external ear is subject; many of the abnormalities, when sufficiently marked to warrant surgical interference, can be corrected by the several forms of plastic technique, which I will endeavor to describe:

PLASTIC TECHNIQUE.

The experiences which we have gleaned in the past few years in perfecting the details of submucous operative work on the nasal septum offer a new field in plastic ear surgery, for by applying the same principles which have been so successfully used in submucous work on the cartilages of the nose, to subdermal manipulation of the elastic cartilages of the ear, we are enabled to obtain satisfactory results in the correction of deformities, by measures which if formerly adopted would have been found impracticable and inadequate.

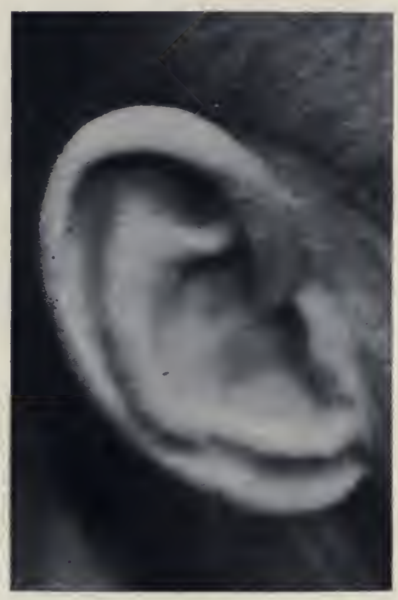


Figure 8.

Wildermuth Ear; Prominence of the Antihelix; Absence of Lobule.

Correction of macrotia:—

Macrotia or undue length or width of the auricle may be such a conspicuous deformity that the patient will be glad to find relief for this condition, providing the reduction in the size of the ear can be effected without much pain, loss of time, or perceptible scar. The operation which seems to have gained some favor for the cosmetic correction for this deformity, and which is occasionally briefly described in the modern text books on surgery, is illustrated in plate I (figures 1, 2 and 3).

An incision is made through the entire thickness of the auricle, from *a* to *b* (figure 1); the upper incised segment of the pinna is pulled downward over the lower segment, and with this traction the operator gauges the amount of tissue necessary to be removed at the line *d b* (figure 2), to correct the deformity. An incision is made from *d* to *b*, and the overlapping triangle of tissue, *d b c*, composed of the cartilages and of the anterior and posterior surfaces of integument, is entirely removed.

The axis of the helix at *d b* is now seen to be shorter than the axis of the helix at *a b* of the lower segment. To obviate this, a narrow, wedge-shaped segment, *x y z*, is now removed, so that the line *d b* and the line *a b* may be of the same length, and the edges of the helix at the points *a* and *d* are in one continuous curve.

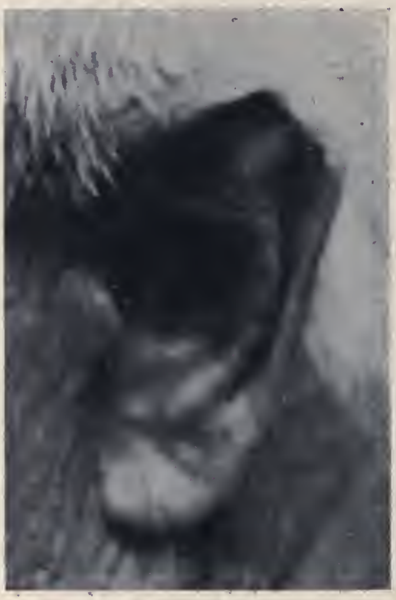


Figure 9.

Absence of Helix.

The edges *d b* and *a b* are now united by sutures alternately from the outer and inner surface of the ear, and a small suture may also be introduced, uniting the small wedge-shaped incision from *x* to *z* (figure 3). This technique will reduce both the length and the width of the auricle to such a size as the operator may elect.

The objections which may be offered to this method of operation are, that some scarring will result, both to the anterior and posterior surface of the auricle, and that the complete resection of the cartilage, without furnishing any underlying support for the newly constructed resected area, is a weak surgical principle. The cartilages of the ear are too poorly nourished, and the healing of such a wound will take place mainly in the thin integument, and will leave a permanent weak spot at the lines of incision through the cartilage.

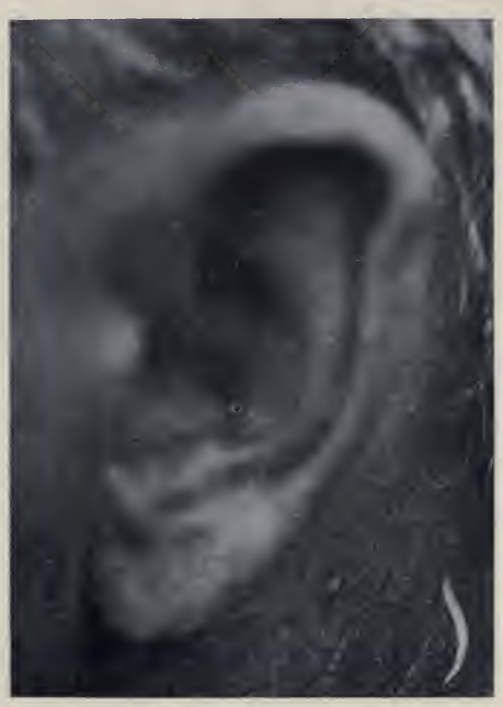


Figure 10.

Abnormal Length of Auricle and of Lobule.

Author's operation for correction of macrotia:—

To overcome these objections I have devised an operation which is simple, safe, and surgically sound. The principle of this technique is that of separating the cartilage from its perichondrium and skin covering, both anteriorly and posteriorly; of constructing flaps of cartilage to meet the requirements of the case in hand; of sliding the two cartilaginous flaps over each other; to effect a firm junction at the area of resection; and to do all of the operative manipulations on the posterior surface of the auricle, so that when the single external incision is healed, an almost invisible linear scar on the posterior surface will be the only evidence of the operation.

The curvilinear incision *a b* (plate II, figure 1) is made on the posterior surface of the auricle, almost corresponding with the natural ridge of the antihelix anteriorly. The convexity of this curved incision line presents outward towards the rim of the helix. The flap is shaped so that when it is dissected upwards and over toward the mastoid area, the largest possible surface of cartilage is exposed. The dissection of the integument flap and perichondrium from the cartilage is simple, and as the adhesion of the perichondrium is not firm, it can be quickly done.

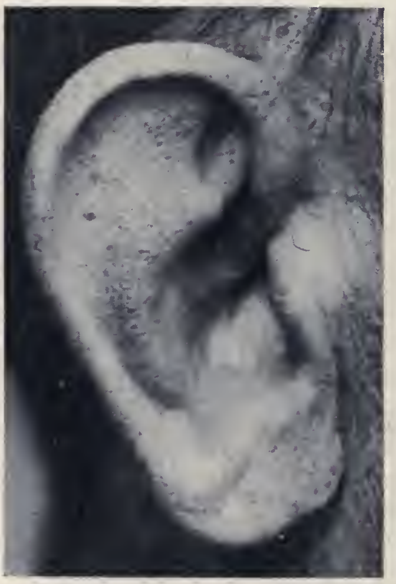


Figure 11.

Abnormal Width of Lobule.

When the cartilage is cleanly exposed, an incision in the line *e f* (figure 2), curving inwards, almost at a right angle at points *e* and *f*, is made through the cartilage, care being taken not to wound the underlying integument which forms the anterior covering of the auricle. With a narrow, blunt elevator, such as is used in the resection of the nasal septum, the two cartilaginous flaps at *c d* and *e f* are now carefully elevated from the underlying perichondrium to a sufficient breadth to admit of their manipulation, and to permit the flap at *c d* to be superimposed upon the flap at *e f,* when brought together by a series of two mattress sutures, each suture being passed twice through each of the cartilages. When gentle traction is applied in tightening the sutures, the two cartilaginous flaps will be drawn over each other and the width of the auricle reduced in the same proportion as the sutures are introduced from the edges of the respective cartilaginous flaps.

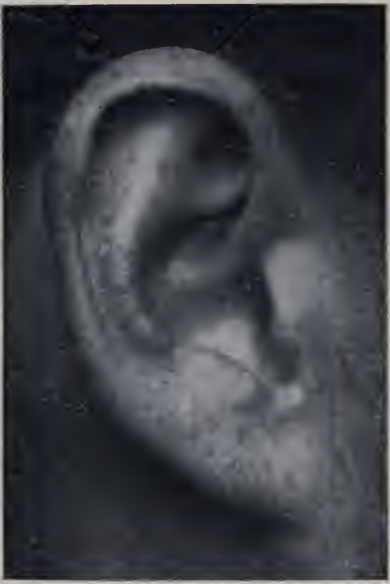


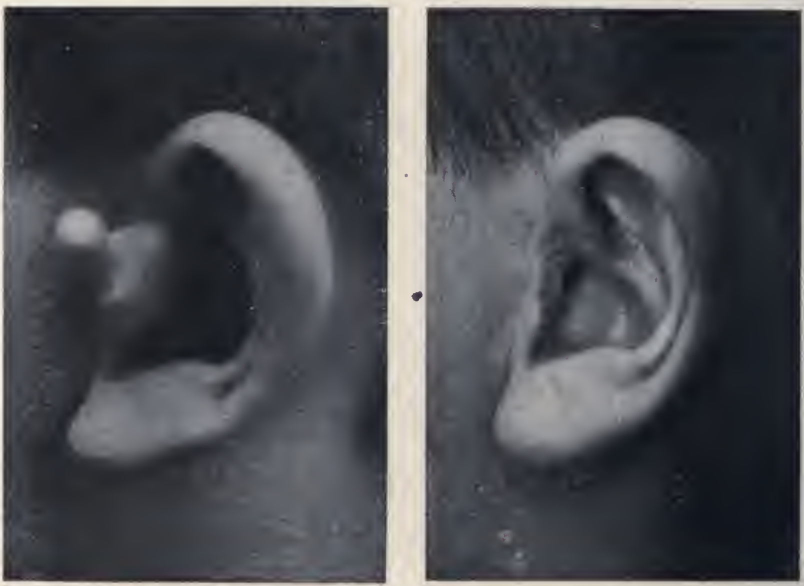
Figure 12.

Synechia or Adherence of Lobule.

The sutures are applied by first passing a sharply curved needle, armed with thin chromatized catgut, through a point at the upper end of flap *c d,* then downward through a point just opposite in flap *e f;* then from below upward through flap *e f,* then over and under through an opposite point in flap *c d.*

Another suture is similarly placed in the lower part of these flaps. The cartilage is tough, and will stand considerable traction when the sutures are brought together. The sutures are then tied over flap *c d* (figure 3), the redundancy at the edge of the integument flap *a b* is then carefully cut away and the integument stitched in position in the original line of incision (figure 4). With the traction produced by the overlapping of the cartilaginous flaps, some slight wrinkling or puckering may at first appear on the anterior surface of the auricle, but if the anterior perichondrium and integument have been liberally elevated from the cartillage, this wrinkling of the integument will disappear with the healing of the wound.

I have simply described the technique for reducing the width of the auricle by modifying the line of incision and shaping the curve of same to conform to the area where reduction of length or width of the auricle is desired. This operation may be utilized for the correction of any form or extent of enlarged auricle.



Before Operation.

After Operation.

Figure 13.

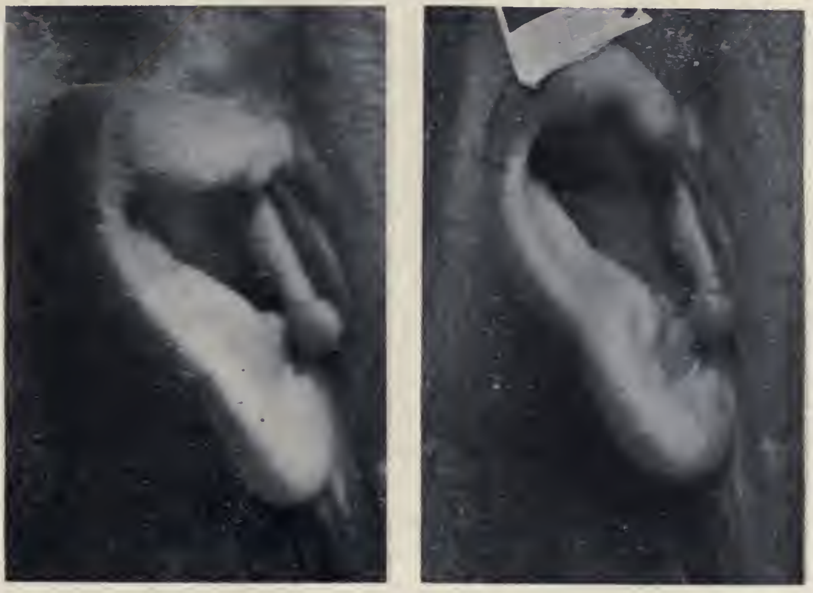
Supernumerary Tragus.

An examination of such an ear after the wound has healed will show the reduction in the length or width of the auricle, shaped according to the judgment of the operator, and will present a reinforced and overlapping cartilaginous surface at the area of resection and an almost invisible linear scar on the posterior surface of the auricle. The anterior surface of the ear shows no participation in this operation.

I believe that this method of operation, with such modifications as may suggest themselves to the operator, in the re-shaping of each given case, may be utilized for the cosmetic correction of all forms of macrotia and abnormally enlarged ears.

The correction of the prominent ear:—

The correction for the prominent or projecting ear has been, perhaps, the most popular and most frequently undertaken of any in the field of cosmetic surgery of the ear. Where this deformity is very apparent, and where the auricle projects at an unusually prominent angle, the cause may be ascribed to an undue redundancy and elasticity of the cartilages of the pinna. In some of the chapters on plastic surgery in surgical text books the correction of this deformity has been dismissed with but a few words, and the opera-



Natural Position.

Helix stretched upwards showing deep fistula and undeveloped tubercle.

Figure 14.

Multiple Deformity of Auricle.

(Case of Dr. J. B. Shapleigh.)

tion suggested for this correction has consisted simply of an incision of an elliptical section of skin over the posterior surface of the auricle, close to the insertion line of the auricle to the head, and the operation completed by a line of sutures of the two presenting integument flaps. In the unduly prominent ear there is a preponderance of cartilaginous surface, and this simple form of operation is insufficient.

We again draw on our experience in the plastic surgery of the nasal septum where it has been definitely determined that the correction of deflected septa is not overcome until the redundancy of cartilage is removed. This same principle must apply in the correction of the prominent ear; the biconvex lens-shaped section of skin, *a b c d* (plate III, figure 1) is removed; a narrow elliptical section of cartilage, *e f* (figure 2), is now carefully elevated and excised; the cartilaginous edges, *e f,* are drawn to the periosteum, *g, h,* by three or four thin catgut sutures (figure 3), and the two skin edges *a d b* and *a c b* are sutured (figure 4) in position.

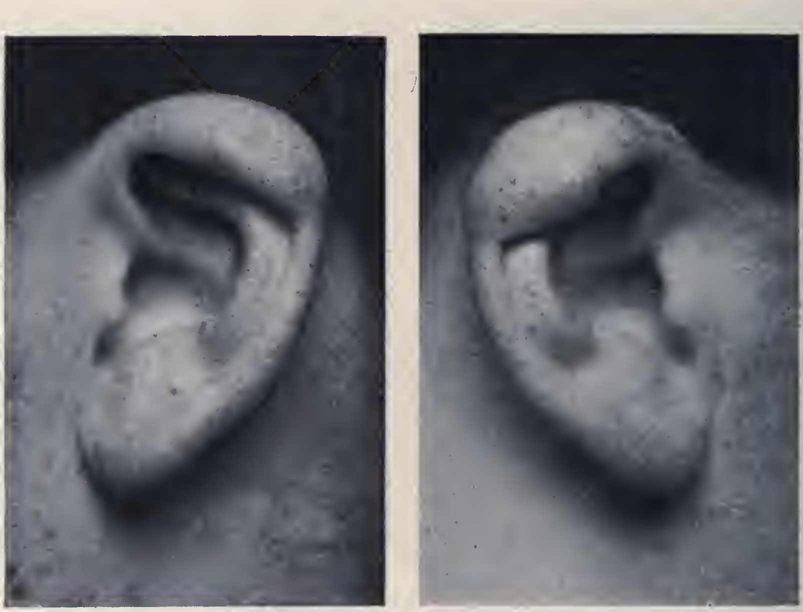


Figure 15.

Redundancy and Deformity of Helix.

The principal object in this simple operation is to remove the redundancy of cartilage and reinforce the skin traction by anchoring the underlying resected cartilage to the periosteum over the mastoid area.

Correction of the misshapen helix:—

This deformity rarely assumes sufficiently prominent proportions to warrant surgical intervention, even for cosmetic reasons, but at times a slight operation may be grateful to patients, especially women of comely appearance, where such deformity offers much embarrassment. In many of these cases I have found a redundancy and curling over of the skin covering the helix rather than a hyperplasia of the cartilage comprising the helix. In this class of cases it is simply necessary to make an elliptical resection of the skin over the posterior area of the pinna, near the helix, thoroughly detach the integument from the cartilage of the helix, so that it may be easily drawn backward, and suture the two surfaces of skin with a small needle and thin black silk. An adhesive strip drawn from

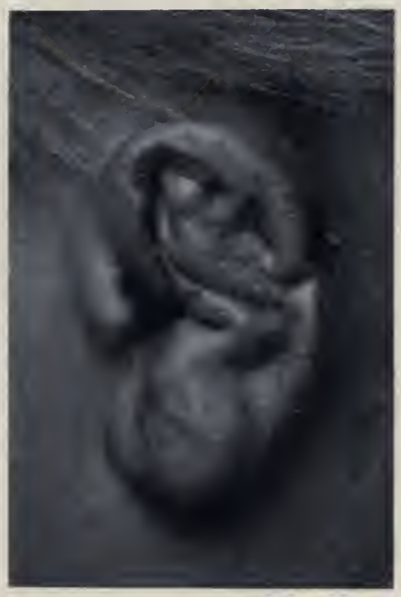


Figure 16.

Deformity of Auricle, produced by Perichondritis and Necrosis of Cartilage following the Radical Mastoid Operation.

the anterior surface of the pinna over the helix and stretching backward over the posterior surface of the auricle, completes this plastic.

The correction of exaggerated size of the lobule:—

The preponderance of adipose tissue of the lobule either in length or in width produces a very unsightly ear, and when this is unilateral cosmetic correction is justifiable. As the lobule is constructed entirely of soft tissues and quite vascular, it may be easily reduced in length or width by a simple resection of a wedge-shaped piece, and the approximation of the edge by one or two sutures; the parts are vascular and heal promptly.

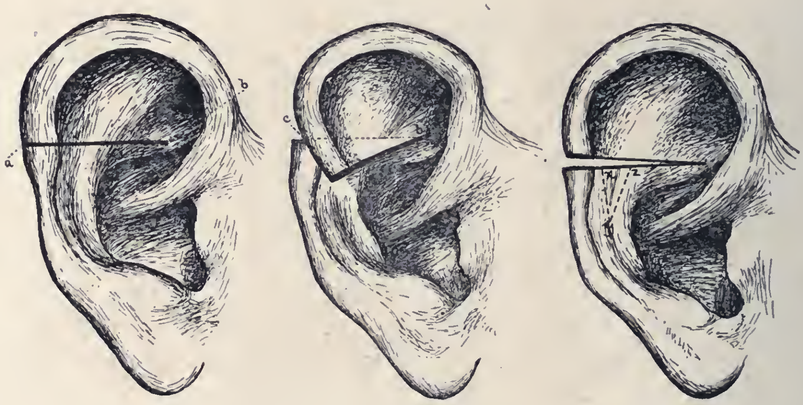


Figure 1. Figure 2. Figure 3.

Plate 1.

Usual technique for Reducing Macrotia.

The correction of synechia of the lobule:—

This abnormality in the shape of the ear is very frequently met with, and is at times sufficiently marked to cause the patient to ask for its correction. The following method is suggested to rectify adhesion of the lobule:

Raise the flap *a b* in front of the ear (plate IV, figure 1), with its base attached to the lobule, and dissect it up to a line corresponding with the normal perpendicular of the lobule. On the posterior surface of the lobule raise the flap *c d* (figure 2), having its base attached to the extended insertion line of the auricle on the neck. Divide the lobule along the line *e f* (figure 3), check the bleeding by hot compresses or adrenalin; with the flap *a b* cover the exposed posterior surface of the lobule, and with the flap *c d* of similar length and shape the wound surface of the neck is covered. If the flaps have been carefully shaped and are nicely adjusted they may be held in position by aseptic adhesive strips without suture.

There have been other methods presented for operative plastic on the ear, some of which appear impracticable; others too complicated to produce thorough coaptation of wound surfaces, and productive of unsightly scars; and some few even impossible. I have confined myself to a description and selection of such methods of operative technique as may be legitimately and safely carried out, and which will yield satisfactory results.

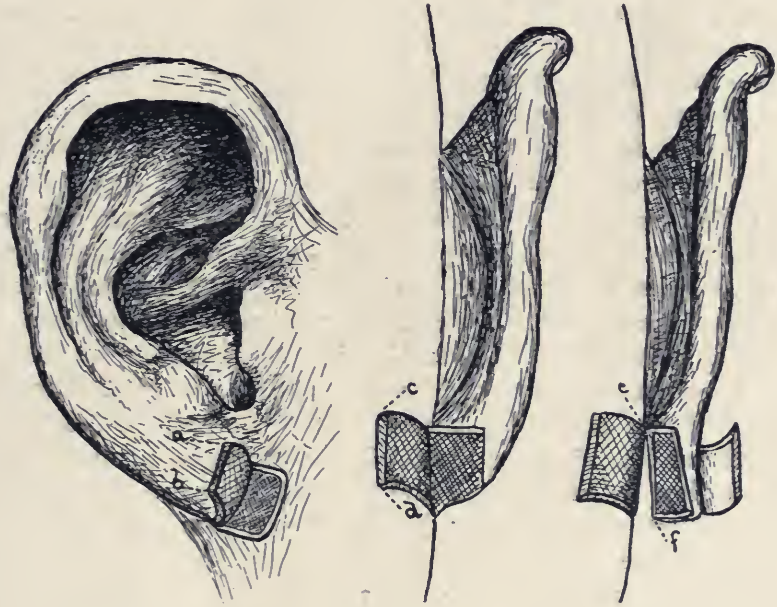


Figure 1. Figure 2. Figure 3.

Plate IV.

Radical Correction of Synechia of the Lobule.

PLASTIC SURGERY OF THE AUDITORY CANAL.

Perhaps the most important use to which plastic surgery has been put in otology is the construction of the skin-flap shaped from the membranous anterior canal wall, and utilized in lining the greater part of the excavated bone cavity, following the radical mastoid operation. The proper means of obtaining epidermization of this large bone cavity still forms one of the much discussed problems of the radical operation.

The history of plastic surgery of the mastoid dates back to 1899, when the Stacke modification of the Schwartze operation was first presented. The character of the technique of the Stacke modification demanded that the exposed bone cavity so produced be covered in some way, or reconstructed from some tissue to insure a permanent healing of the wound. In the Stacke operation, where the tympanic cavity proper is exposed and operated upon before the antrum is reached, where the membranous auditory canal is stripped from the bone, and where a considerable resection of bone is made, it is evident that some measure must be undertaken to cover the newly exposed bone surfaces.

It first occurred to Stacke to utilize the membranous auditory canal as an epidermal lining for the exenterated bone cavity, and the first plastic method associated with the mastoid operation consisted of simply splitting the plastic canal wall by a longitudinal incision in the median line, reaching from the fundus to the concha. This produced an upper and lower triangular flap, but because of the resiliency of the cartilaginous part of the canal wall and the insufficient size of the flaps so obtained, an improved plastic method was offered by Stacke, and later modified by Jansen, now known as the Stacke-Jansen plastic. (Stacke Plastic, plate V.)

The Stacke-Jansen plastic consists of a longitudinal incision through the superior wall of the auditory canal from the fundus to the concha. At right angles to this incision at the concha end a second incision is made, forming a rectangular flap, the full size of the posterior canal wall. This flap is pulled downward and backward to cover the lower area of the exenterated bone cavity. Jansen holds the flap in position by forceps or a narrow chisel, and introduces the gauze packing through the enlarged auditory canal, thereby holding the flap in its new position. (Plate VI.)

The Panse plastic is a substantial modification of the Stacke flap; the first incision is made longitudinally along the median line of the posterior canal wall, extending from the fundus to the concha; at the exterior end of this incision a perpendicular incision is made, forming an elongated letter T; or in other words, a longitudinal median incision, with two right angle flaps, one ending in the superior line of the canal wall, and the other in the inferior line.

One flap is turned upward and lines the superior portion of the bone cavity; the second flap is turned downward and lines the posterior wall and floor of the bone cavity. This plastic admits of the largest possible area for inspection of the field of operation. Panse recommends that in the making of the flap incision a pair of forceps should be passed into and throughout the length of the external auditory canal, and the posterior wall divided while stretched over the open blades of the forceps.

Another procedure which has proven of much value in a large number of cases, where the resiliency of cartilage has interfered with the proper coaptation of the flaps of the bone surface, was suggested by Panse: when the T-shaped incision has been made the right angle corner of each flap is lifted up betwen delicate forceps and the underlying cartilage and connective tissue is carefully cut away with curved scissors, producing thinner and much more easily adjusted flaps; these may either be sutured into position or be held in place by gauze tampons. (Plate VII.)

The Kôrner flap is the plastic of choice of the majority of operators to-day, because of its simplicity of technique, and because the single, tongue-shaped flap affords the largest area to cover the exenterated cavity. The Kôrner flap consists of two parallel incisions through the membrano-cartilaginous canal, one along the upper border and one along the lower border of the posterior canal wall. To facilitate proper coaptation and adjustment of this flap, especially where there is a redundancy of cartilaginous and subcutaneous tissue, the under surface may be very materially pared down, and the stiff cartilaginous sub-structure dissected away. Care must be taken in the preparation of this flap to make a thoroughly clean dissection so that no particles of poorly nourished cartilage remain for subsequent sloughing. (Plate VIII.)

An active enchondritis following the various plastic methods in the radical mastoid operation may take place and may give rise to most marked and irreparable deformities of the auricle. (Figure 16.)

Siebermann has presented a modified plastic by which the median incision in the canal wall is extended upwards and downwards to form a triangular or Y-shaped secondary flap in the depth of the concha. This flap suffers additional difficulties in technique, and, as a rule, the membranous canal is not large enough to construct a triangular flap of sufficient size and tissue to be of any practical significance. (Plate IX.)

The Ballance flap is a more recent modification, and is especially adapted to the radical mastoid technique as suggested by Ballance, together with his plan for subsequent skin-grafting. The Ballance incision is of the shape of a shepherd's crook. A median incision is made through the posterior canal wall, extended from the tympanic end to the concha, and ending in a semicircular incision encroaching far into the concha, the curve of the incision being downwards. This produces a large, irregular shaped flap superiorly, and a smaller inferior flap. Ballance prefers to suture his flaps into position. Ballenger recommends an anchor suture, held in place by little rolls of gauze, as a modified technique, to hold these sutures in position. (Plate X.)

It may be observed that the majority of operators to-day prefer not to suture the flaps in the radical mastoid operation, but depend for the adjustment of same on dressings and gauze packs. By omitting the suture there is one less possibility of infection, and the time of the operation is somewhat shortened.

There are other modifications in the formation of the plastic flaps used in the radical mastoid operation, as suggested by Kretschmann, Neumann, Passow and others, but the principal modifications have been here enumerated.

PLASTIC SURGERY OF RETRO-AURICULAR FISTULA.

In a large number of cases where the radical mastoid operation has been performed, conditions may be present where it is unadvisable to close the entire posterior wound, and conduct the entire after-treatment through the enlarged anterior opening. Where cholesteatoma has been found, where extensive sloughing of the soft parts over the mastoid area has taken place, where bone necrosis has been active, especially when associated with syphilis tuberculosis or other constitutional dyscrasia, where dura or sinus has been exposed or opened, or where for any definite reason the operator finds it necessary to critically inspect the exenterated area during the healing process, the posterior wound must be carefully packed and allowed to granulate from the bottom, and the after-treatment conducted similar to the plan employed in the classic Schwartze operation. In this class of cases it will frequently be found, where granulation and cicatrization have taken place, that a well-defined fistula, varying in shape, depth and diameter, has been established.

The disposal of such post-auricular fistulae is often a troublesome matter to the surgeon. It is a safe plan not to undertake the plastic closure of such fistulae until the operative field has been thoroughly healed and the parts thoroughly epidermized or cicatrized and freed from wound secretions.

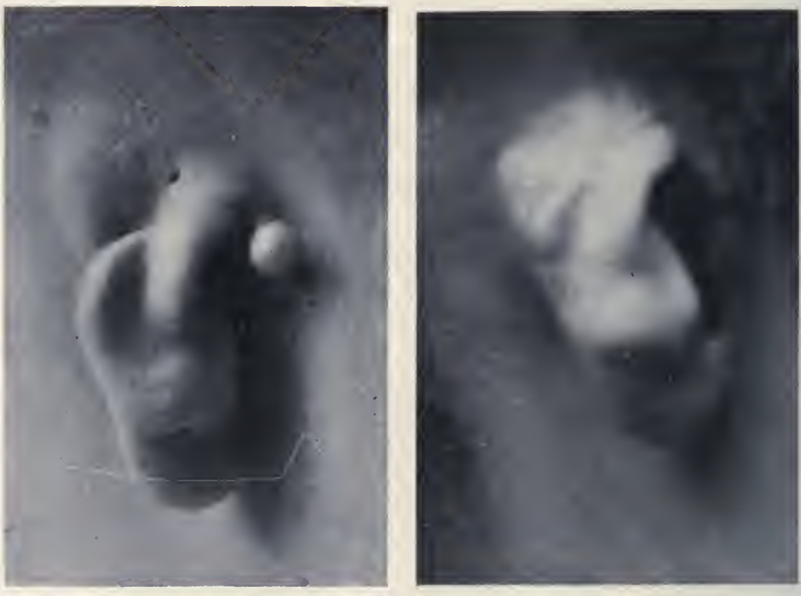
The first description of plastic closure of retro-auricular fistulae is presented by von Mosetig-Moorhoff *Monatsschrift f. Ohrenheilkunde,* 1899, Heft 1). The operation is performed under careful asepsis and general anesthesia, a tongue-shaped flap is made below the retro-auricular opening, the size of the flap constructed being somewhat larger than the fistulous opening. The flap is carefully dissected up, so that a smooth underlying wound surface may be exposed. An incision is next made round the circumference of the fistula, and a free and freshened edge is produced by knife and elevator. The tongue-shaped flap is now lifted from its bed and inverted into the fistulous opening, care being taken to preserve the hinge-like flap in its integument attachment to the lower edge of the fistula. By the inversion of the flap into the retro-auricular opening the epidermis presents inward and the wound surface outward. The flap edges are now adjusted to the freshened and elevated edges of the retro-auricular opening by four catgut sutures. The edges of the lower wound, from which the flap has been taken, are now approximated by two or three sutures. The raw surface of the flap presenting externally, is either covered with skin grafts or allowed to cicatrize, the author preferring the latter method. See plate XI.

Another form of plastic was suggested by Trautmann (*Archiv f. Ohrenheilk.,* Bd. XLVIII, Heft 1). Trautmann performs this operation by means of infiltration anesthesia. He creates two flaps of equal size, taking these from the lateral periphery of the retro-auricular opening; these flaps are crescent-shaped and measure four mm. at their widest point. The anterior flap includes the perichondrium; the posterior flap includes the periosteum; these flaps are turned inward to cover the post-auricular opening, and their edges approximated by four thin catgut sutures, as indicated in figure 2, plate XII. In placing the sutures the author emphasizes the practical value of passing the needle in and out of the same side, as he finds it a much simpler technique, and can adjust the position of his suture points much more easily than by using the needle from one side to the other. The next step in the operation is to elevate the skin about the freshly made circumference, as indicated in figure 3, plate XII. Three sutures are now placed in position from side to side, and the skin drawn over the surfaces of the newly constructed flaps, and the edges approximated in the median line. The advantages claimed for this form of plastic are:

(a) That it admits of the plastic closure of larger openings.

(b) That no wound surface remains exposed.

(c) That the reinforcement created by the underlying flaps and the overlying integument produces a firmer closure of the retro-auricular opening.



Before Operation. After Operation.

Figure 17.

Polyotia and Macrotia with Congenital Aural Fistula.

(Case of Dr. W. D. Black.)

There are several points in criticism of these plastic operations which I desire to offer, and for which I present another form of operation, the results of which practically substantiate my position.

The retro-auricular fistula is the result of necessity, and not of choice. It occurs most frequently after extensive bone exenteration; it is produced by our reluctance to entirely close the posterior wound in order to keep the field of operation thoroughly under observation and control. Under these circumstances the wound heals more slowly, and frequently with extensive cicatrization, binding the dermal tissues tight to the underlying and frequently deeply excavated bone.

The clinical picture of such a retro-auricular opening is not often as simple and favorable to post operation plastic, as is presented in the technique of Mosetig-Moorhoff or Trautmann. Sometimes the cicatrized tissue is so extensive and the excavated bone area of the mastoid so deep that it is a practical impossibility to construct the flap of healthy skin below the retro-auricular opening, because no healthy skin can be found there. Often the stellate cicatrization spreads about the circumference of the retro-auricular opening so freely that it is not surgically possible to construct the crescent-shaped bi-lateral flaps of Trautmann at a distance of four mm., or even of six or eight mm., from the periphery of the opening.

Author's Retro-Auricular Plastic.

The technique which I have carried out in a number of cases where such unfavorable conditions for plastic exist, is simple. I select the area where healthy skin joins cicatricial tissue, make an incision through the integument anteriorly to the perichondrium and posteriorly through the periosteum. The shape and length of this incision varies with the character of the cicatrix and the size of the wound. With a slender elevator, such as is used in the submucous resection of the nasal septum, the skin and perichondrium over the auricle anteriorly, and the skin and periosteum over the mastoid area posteriorly is elevated until sufficient tissue has been loosened to allow approximation of the two edges, with the least amount of tension.

The next step in the technique is identical with that used in the primary closure of the posterior wound following the radical mastoid operation. The two edges of the skin are carefully drawn together and held in position by the Michel metal clamps, the number of clamps used depending on the length of the wound. The underlying cicatricial tissue is not disturbed. The vertical incisions made to relieve tension are allowed to granulate in their gaping areas.

Two vertical incisions, each of about fifteen to eighteen mm. in length, are then made at a distance of about ten to twelve mm. from the freshened margins of the wound, the anterior incision extending through the perichondrium and the posterior incision through the periosteum. The elevated tissue should extend to the lines of incision. By means of these incisions all possible tension when the wound edges are drawn together, is corrected.

This is a simplified technique, offering none of the disadvantages which are occasionally met in the methods of Mosetig-Moorhoff or Trautmann. In two or three cases the auricle has been drawn somewhat closed to the side of the head, because of the larger lateral diameter of the post-auricular fistulo.

The successful closure during the past five years of some fifteen or sixteen retro-auricular openings of various sizes justifies me in presenting this simple plastic technique.

The work that is represented in this paper is by no means exhaustive of the subject matter of cosmetic and plastic surgery as applied to the ear, but offers in a comprehensive way a critical summary of the most practical suggestions which have been gleaned from personal experience and from a careful search of modern surgical literature.

I believe this field to be a rational and logical department of surgery for the progressive, ambitious and skillful ear surgeon, if the cases are selected with care. If good judgment is exercised in the correction of marked aural deformities, the work of cosmetic surgery of the ear may be carried on with dignity, and may afford many opportunities for originality and a demonstration of excellent technical ability.

The plastic surgery of the ear as applied to the mastoid operation and to the conduct of retro-auricular wounds is a classic field and our future attainments in this important chapter of aural surgery will depend largely on our perfection of the plastic work associated with the mastoid operation.

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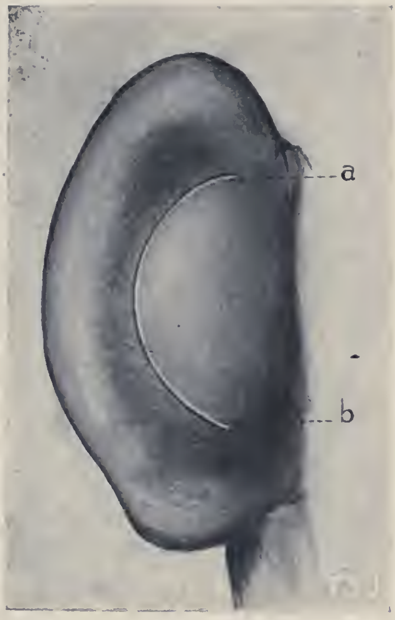

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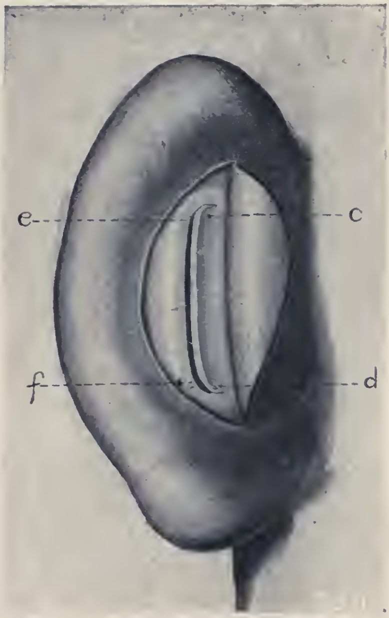

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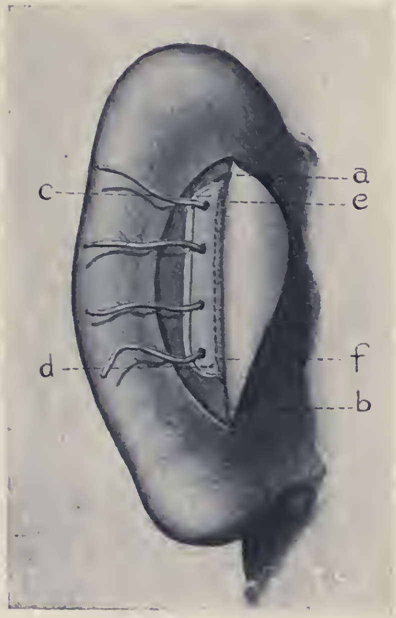


Figure 3.

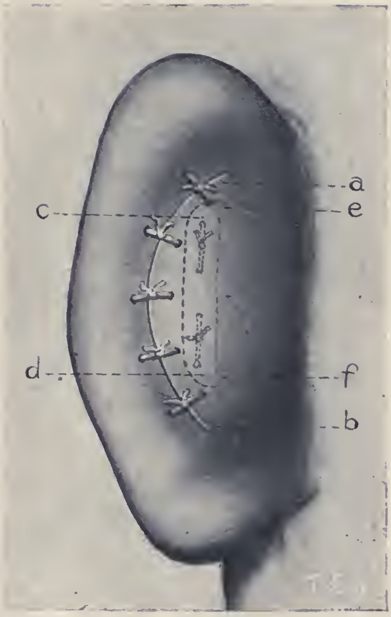


Figure 4.

Plate II.

Author's Operation for Reducing Macrotia.

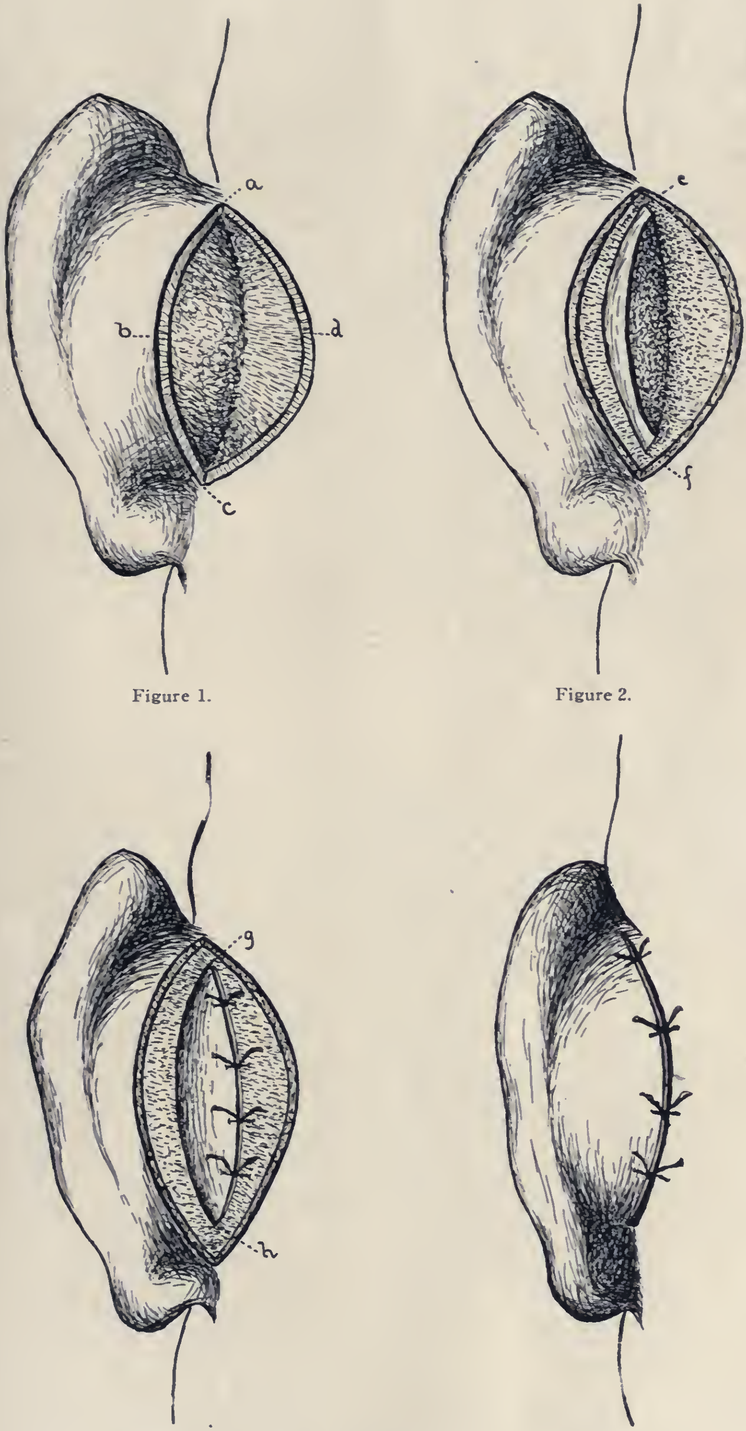


Figure 1.

Figure 2.

Figure 3.

Figure 4.

Plate III.
Author's Operation for Correction of the Projecting Ear.

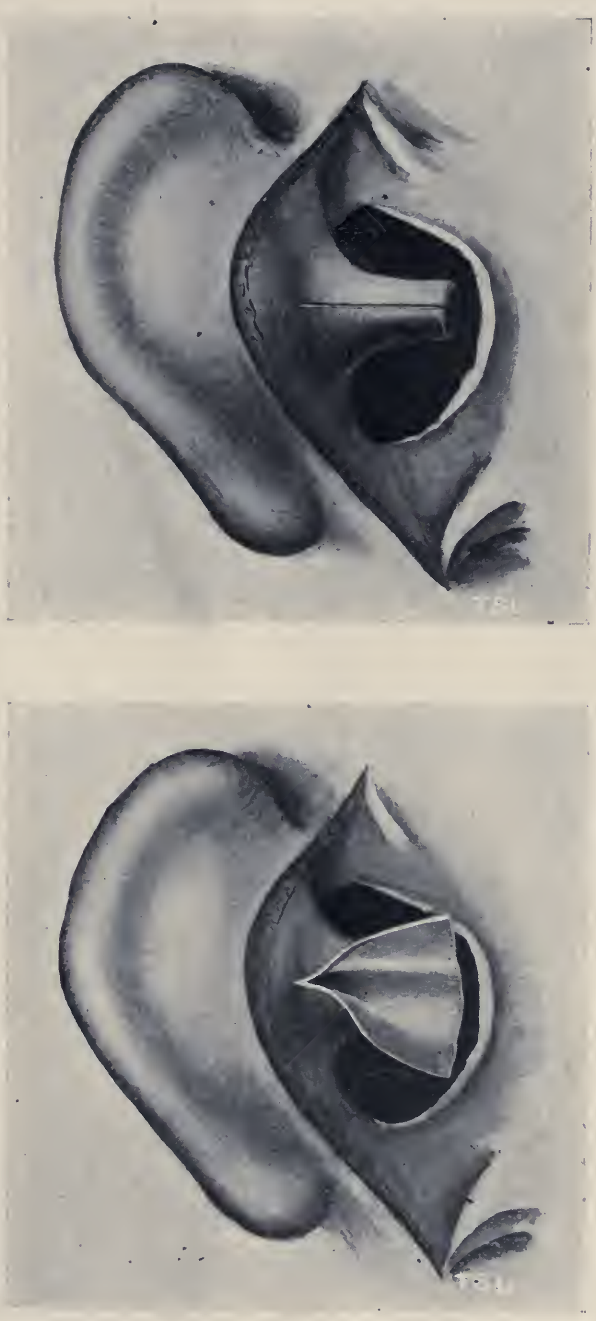


Plate V-

The Stacke Plastic.

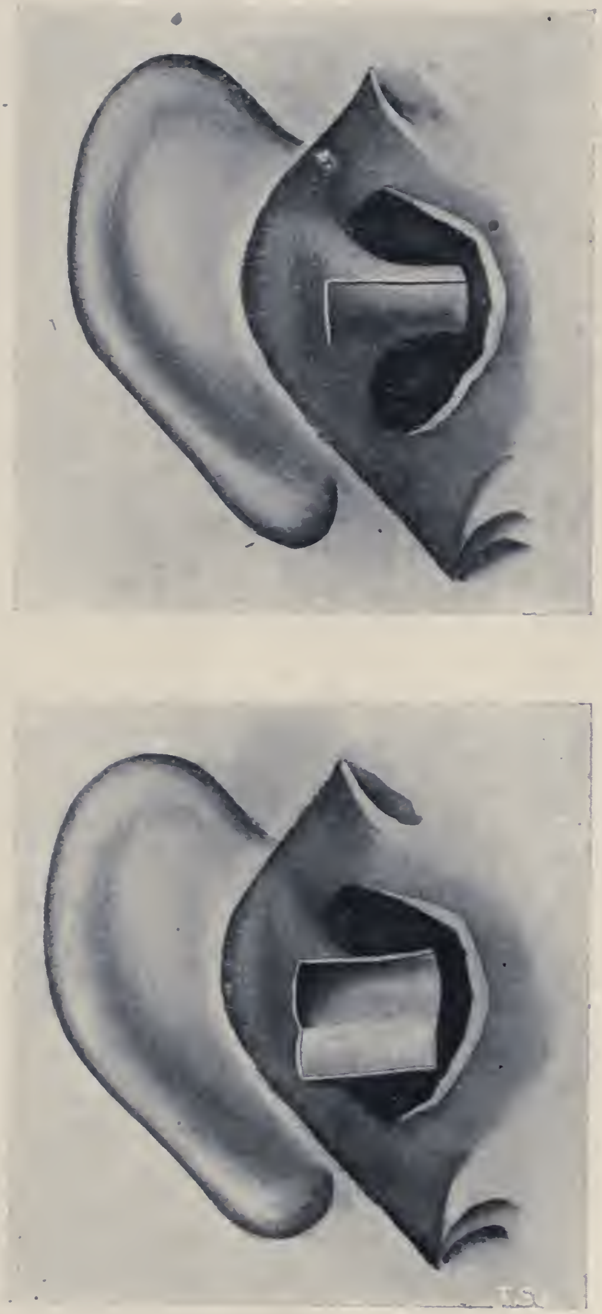


Plate VI.

The Stacke-Jansen Plastic.

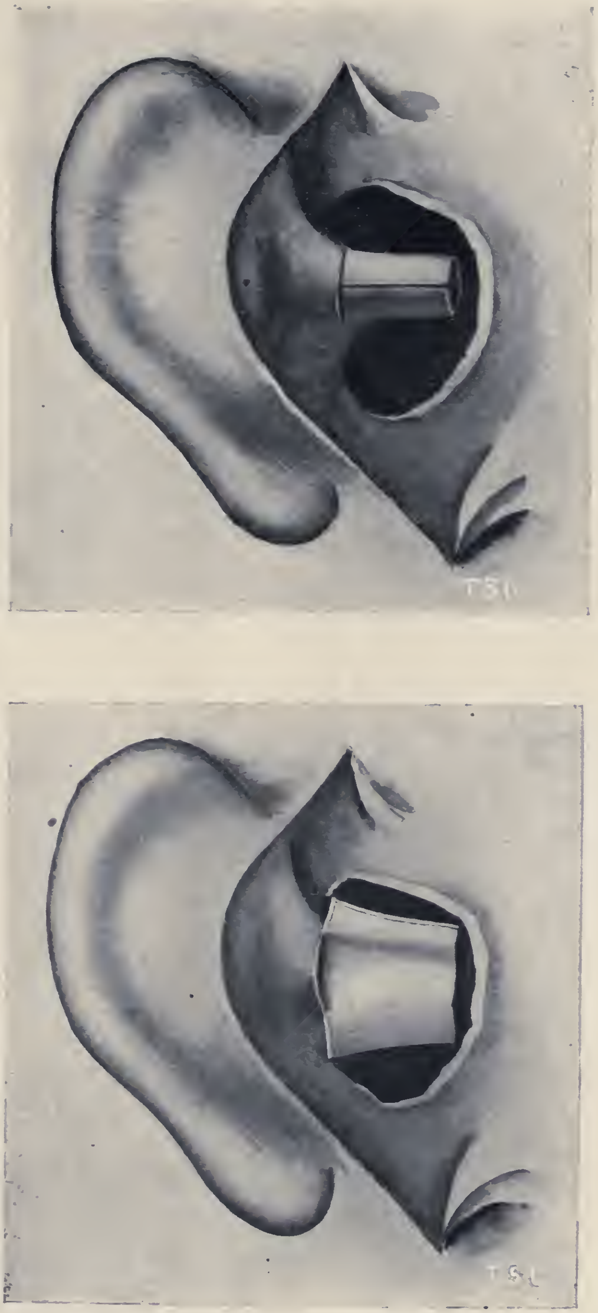


Plate VII.

The Panse Plastic.

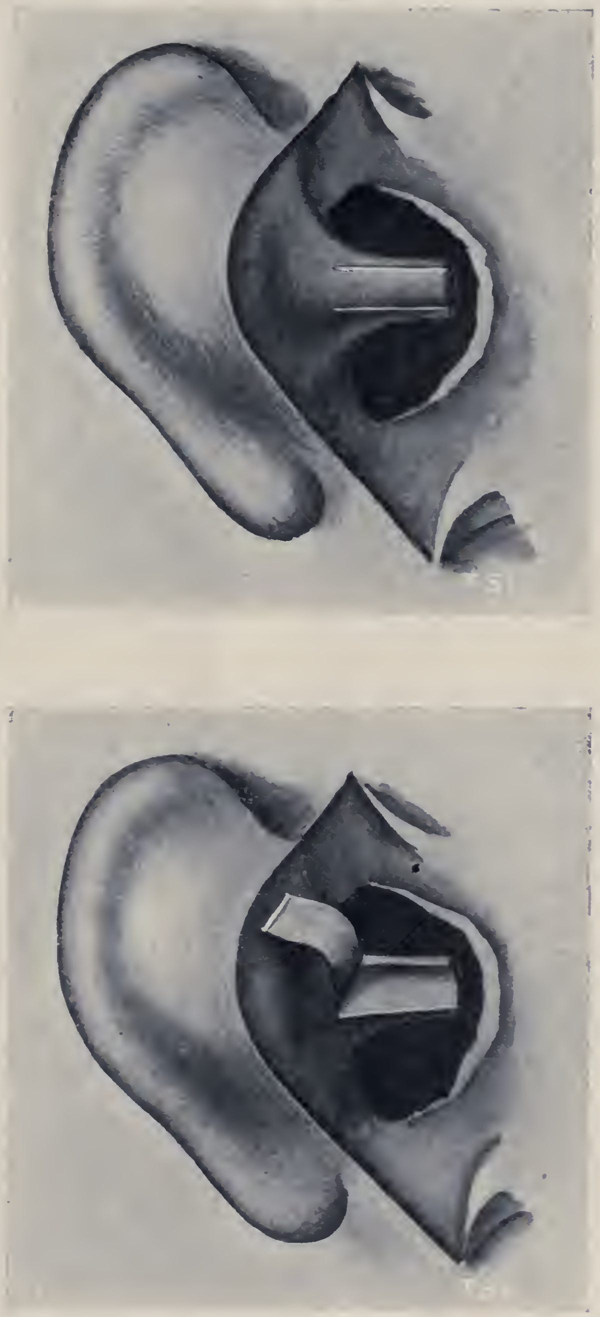


Plate VIII.

The Korner Flap

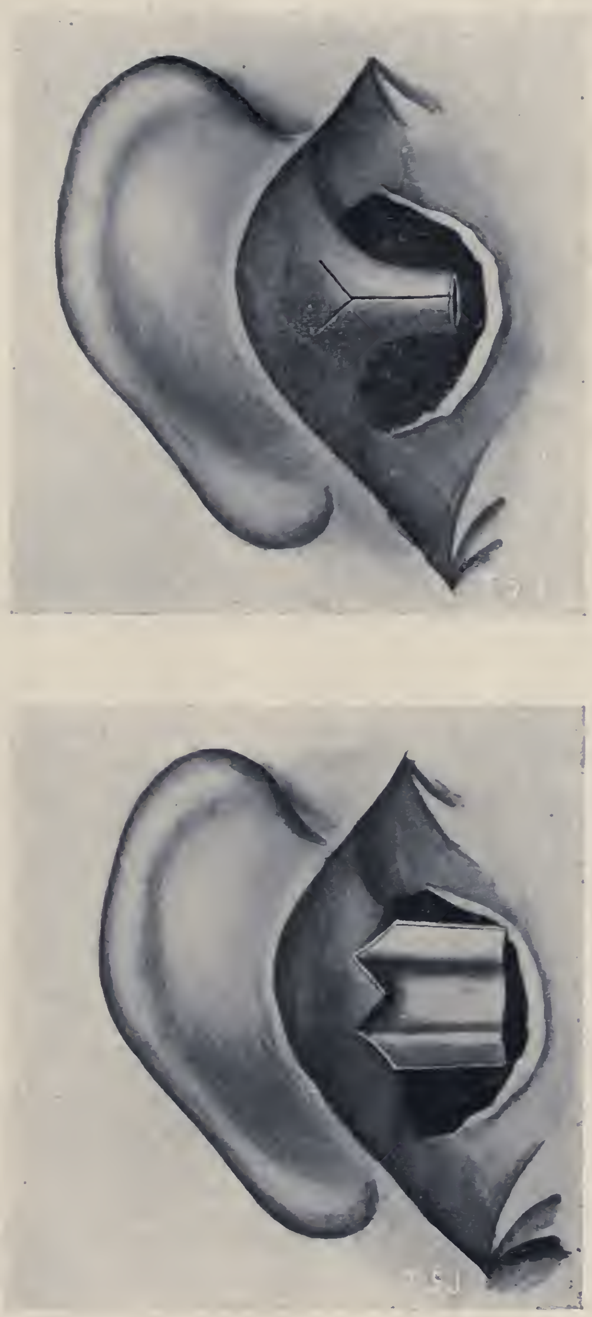


Plate IX.

The Siebenmann Flap.

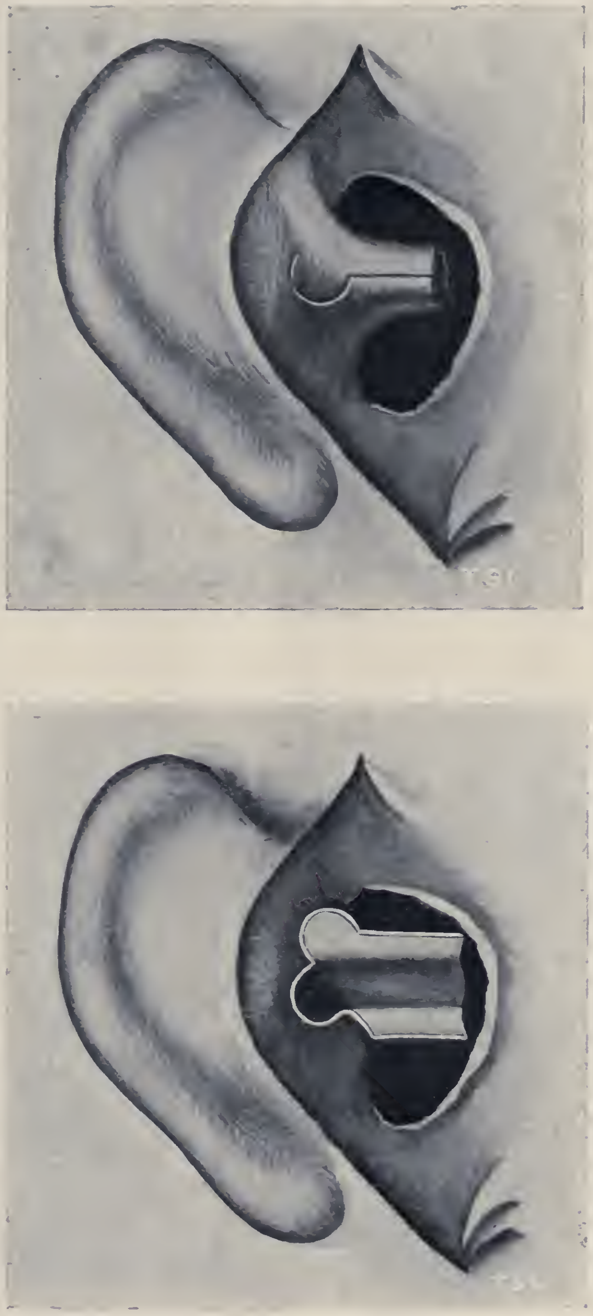
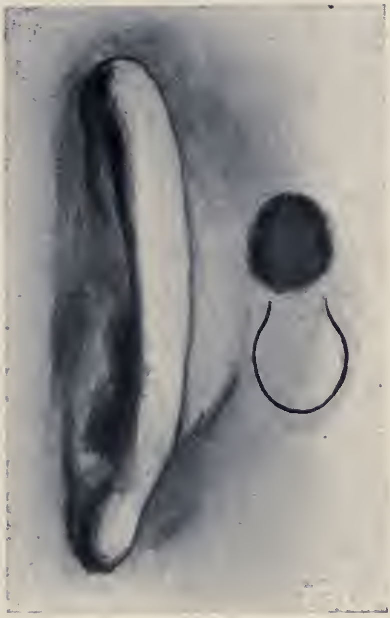


Plate X.

The Ballance Flap.



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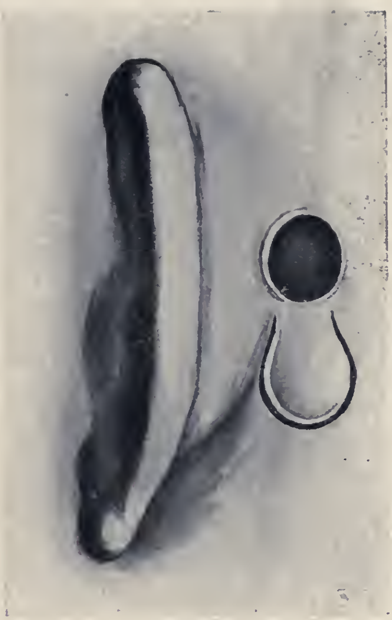


Figure 2.

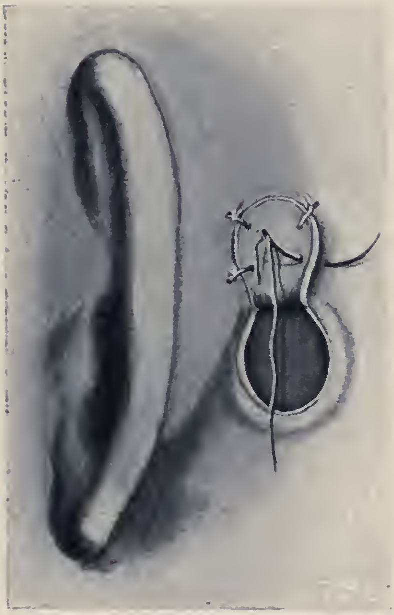


Figure 3.

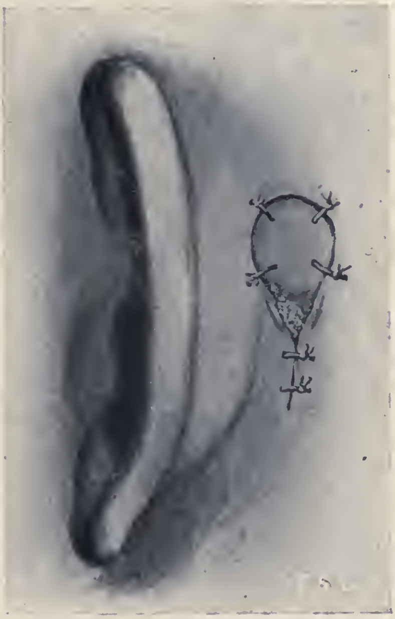
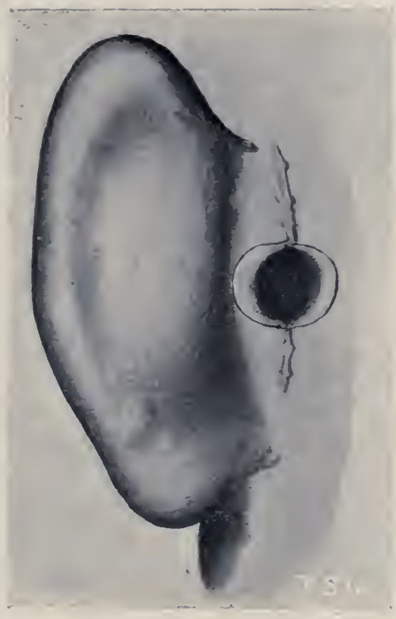


Figure 4.

Plate XI.
The von Mosetig-Moorhoff Operation.



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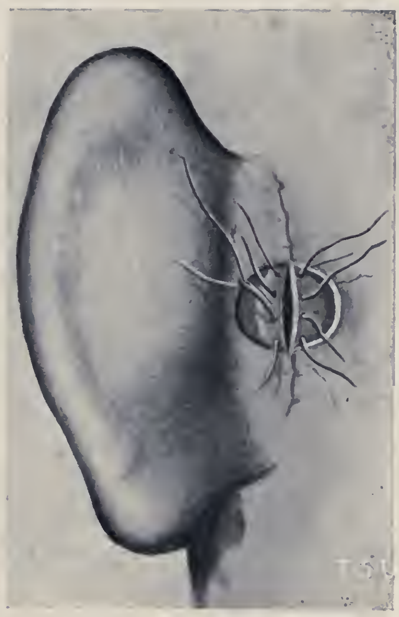

Figure 2.

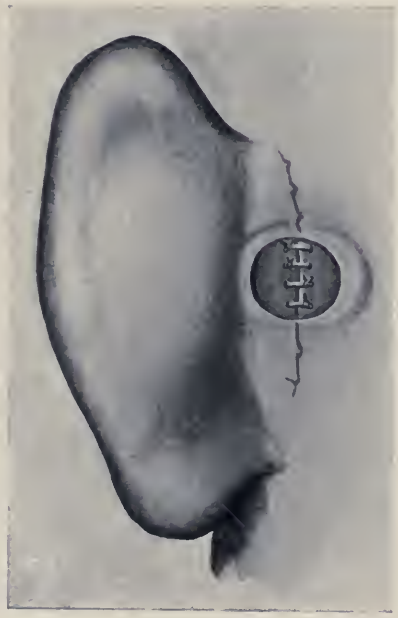

Figure 3.

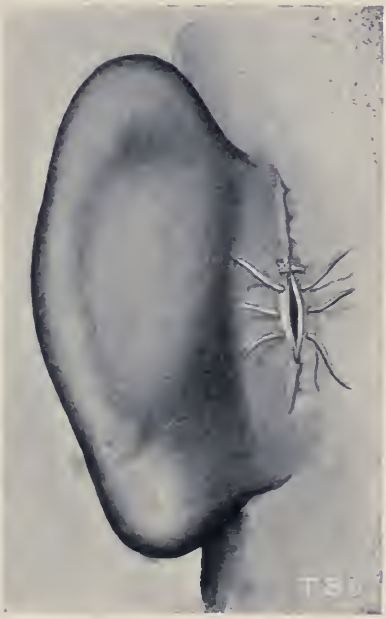

Figure 4.

Plate XII,
The Trautmann Operation.

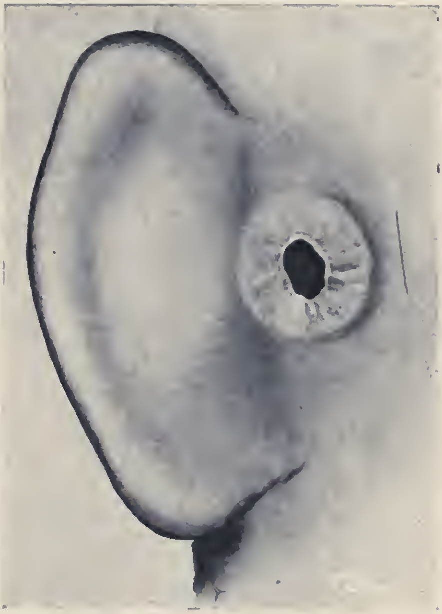

Figure I.

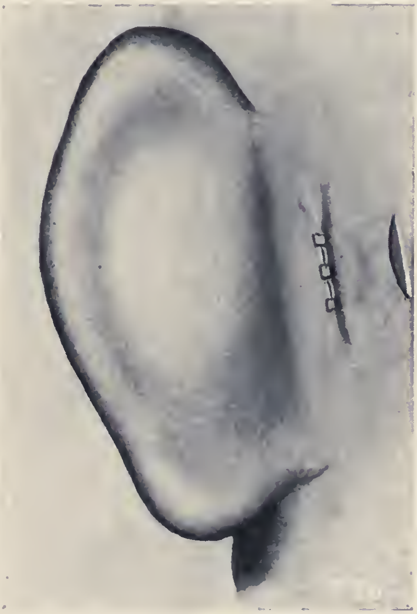

Figure 2.

Plate XIII.

Author's Retro-Auricular Plastic.

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to The Laryngoscope.)

FURTHER OBSERVATIONS ON THE ROENTGEN-RAY EXAMINATION OF THE ACCESSORY NASAL SINUSES.*

BY E. W. CALDWELL, M. D., NEW YORK.

The members of this society are all familiar with the results obtained by examination of the accessory sinuses by means of the Roentgen-ray, and you are all better able than I am to estimate the practical value of such examinations. I shall, therefore, have little to say of the clinical aspect of the subject, but shall consider in this paper chiefly the Roentgen-ray technique.

In the beginning it may be well to consider for a moment some of the very prevalent erroneous ideas concerning X-ray examinations in general. The impression still prevails that the X-ray is a very powerful or special form of light by means of which we may photograph bones and other anatomical structures ordinarily hidden from our view. The wonderful development in photographic apparatus and materials, and the well merited popularity of amateur photography, have made it easy for us to suppose that X-ray work is merely another species of photography. Enterprising manufacturers of X-ray apparatus have found it to their interest to encourage the belief that possession of their wonderful appliances would bring within the reach of anyone the pleasant pastime of making the so-called X-ray photographs.

This misconception of the principles involved in X-ray diagnosis is, in a great measure, responsible for the disappointments of those who have attempted to use the X-ray without knowing how or when it may be of service to them.

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*Presented at the 14th Annual Meeting of the American Laryngological, Rhinological and Otological Society at Pittsburg, May 30, 1908.

In the first place the X-ray does not give us a photograph or even a picture that is like any other picture we know. We are so accustomed to photographs that we do not stop to analyze the physiological processes involved in interpreting them. We do not realize that the ability to obtain accurate impressions of the subject represented by a photograph has been acquired by years of experience. Travelers tell us that uncivilized people acquire very slowly the ability to interpret an ordinary photograph, and that it may take months for a Kaffir native to learn to recognize a portrait of one of his companions.

In viewing a photograph or a picture, the retina receives an impression of light and shadow, and perhaps of color, which is a more or less perfect imitation of the effect which would be produced by viewing directly the object portrayed.

The X-ray gives us projections which sometimes strongly resemble pictures, but these projections never portray an object as the eye would see it. It is therefore unsafe for anyone to attempt to interpret such a projection as he would a picture. We must guard against false impressions of perspective, and must adopt a new view point, which for many seems to be as difficult to acquire as for the Kaffir native to grasp the meaning of an ordinary photograph. When one has acquired this point of view the lights and shadows of a skiagraph represent only results from which he must deduce the cause; he knows that they do not present a front view or a back view or any other *view,* and the expressions "X-ray picture" and "X-ray photograph" cause him weariness and depression. When this point of view has become more prevalent the pictorially excellent skiagraph of a hand or a foot made by some enthusiastic amateur will no longer excite wonder, and the photographers, electricians and janitors who now make the so-called X-ray photographs in many hospitals, will have their activities transferred to other fields where they will be less a menace to the public health.

X-ray appliances are still crude and comparatively undeveloped, and they have not approached the degree of perfection of the apparatus that has brought photography within reach of the amateur. In recent years the demand for more perfect results and the enlarging field of usefulness of Roentgen-ray diagnosis has made it necessary to use more and more elaborate and expensive apparatus. In 1897, when the art was new, one could have bought a fair X-ray outfit for $200, and the best tubes then available did not cost more than $15. These outfits were more or less useful toys, and the same criticism applies to many of the outfits that are now sold to physicians who are inexperienced in this work. With the best appliances now obtainable difficult skiagraphic work, such as we have under consideration, requires a degree of skill and judgment comparable with that which is expected in any other medical or surgical procedure, and greater than we can reasonably expect from the hospital photographer or janitor.

In the less difficult applications of the X-ray a very poor skiagraph may give useful information, and may, therefore, be mistaken for good work. A difficult and brilliant X-ray diagnosis is often less appreciated than a pictorially good plate of some easy subject like a shell fish or a mummy's hand.

An important feature of the diagnostic use of X-rays in the nasal tract is that in this field mediocre work is useless or worse, and the very best that can be done often leaves much to be desired. Many operators who have believed themselves expert because they could make useful skiagraphs of fractures, foreign bodies, teeth, etc., have had so many failures in frontal sinus examinations that their work in this field is of no value.

There is no mystery about this work, and no justification for the statements occasionally heard to the effect that success in this field depends upon some trick which is the secret of a few. It is true that the majority of owners of X-ray outfits are unable to make good skiagraphs of the frontal sinus region, but it is also true that such work is done satisfactorily by practically all of the really competent Roentgen-ray specialists, although probably no two of them employ the same tricks of technique. Excellent work has been done also by a few surgeons and rhinologists who have given the subject the serious attention that it demands and deserves. The comparatively few successes and many failures in the work cannot be charged to secrets of technique, but result partly from the fact that the amount of attention necessary for good work has generally been underestimated.

The difficulty of the work is easy to understand when we remember that the skiagraph is a composite shadow of everything lying between the source of rays and the photographic plate, and that the different objects cast stronger or weaker shadows, according to their relative thickness, their density, and the atomic weights of the elements of which they are composed. A skiagraph of a hand is essentially an X-ray shadow of the bones, which compose a large part of it, and which are but thinly covered by soft tissues, much less resistant to the rays. Such a skiagraph may be easily made with almost any X-ray outfit, and it matters little whether the rays used are of high or low penetration, because the contrast in X-ray opacity of these tissues is great. In making a skiagraph of the frontal sinus region the rays must pass through the head in a long diameter; they must traverse the occipital bone and the brain, but the shadows of these thick and dense structures must not obscure the shadows of the relatively thin bones forming the sinus, or those of the fluids contained therein. It will be evident, therefore, that for this work not only must the penetrating quality of the rays be regulated accurately in order to secure differentiation, but that in order to produce sufficient effect upon the photographic plate, the rays must be powerful, and the exposure long. To obtain all these conditions requires careful manipulation and the best appliances obtainable. The chief difficulty is to obtain tubes that may be operated for these long exposures without breaking, and without too much change in the quality of the rays emitted. No two X-ray tubes are exactly alike, and in practice I find that only about one in five or six of the tubes I buy is suitable for frontal sinus examinations, although for most work they would all be useful.

With a good tube and exciting apparatus a skiagraph of a wrist or hand may be made with an exposure of one second or less, but under the same conditions a frontal sinus exposure will require from 20 to 50 seconds. During such short exposures as one to five seconds, the ordinary tube will not get hot enough to endanger its life or seriously interfere with the quality of the rays emitted, but only a very good tube will deliver continuously the same quality of rays during the long exposure necessary for a good frontal sinus plate. After such an exposure it is advisable to give the tube a rest of at least half an hour to let it cool off before using it again. When the tube gets hot, gases are driven from the glass and metal surfaces, reducing the vacuum, and with it the penetration of the rays. For this reason I prefer large tubes with eight-inch bulbs, and very heavy targets. A given amount of gas liberated in a large chamber of course produces less change of pressure than in a small one, and the rise of temperature in a large heavy target is less than in a smaller one.

The resistance of the tube must be adjusted for rays of high enough penetration to pass through the skull and brain, but rays of too high penetration will not give the contrasts that are necessary. I think that the best penetration is about nine or ten on the Benoist Scale. With this degree of penetration there is danger of cracking or puncturing the tube during a long exposure, and I have frequently ruined, in a single sinus examination, a tube that might have been used safely for a hundred or more skiagraphs requiring less prolonged exposure. It seems to me that in every successful sinus examination the tube must be strained much beyond the limit of safety. On account of this strain the exposure should be shortened as much as possible by using the fastest plates obtainable. My best work has been done with plates made in Germany, but for the last year these plates have proven so unreliable that I have had to abandon them altogether and use American plates, which are fully 25 per cent slower.

The development of the sinus plates does not differ from that of any other skiagraph. Developers giving density are to be preferred, but no two operators agree as to just what is the best developer. My best results have been obtained with pyrogallic acid; next to this I prefer hydroquinone.

When one is provided with the best X-ray outfit obtainable, and has learned to operate the tubes not merely to give X-rays, but to deliver rays of approximately the right degree of penetration for a sufficiently long period, he may properly consider the details of arrangement of plate, tube and subject necessary to show the nasal sinuses to best advantage. My own views on the subject were presented in a paper read before the American Roentgen Ray Society in September, 1906, and published in the American Quarterly of Roentgenology for January, 1907. Since that time I have not modified my technique, except to lengthen the exposures, and thus compensate for the slower plates. Not only has this increased the wear and tear on tubes, but it seems to me that the results I get now are not so good as with the fast plates.

It is, of course, necessary to make a transverse projection in order to show the depth of the frontal sinus. In this projection the rays pass through a short diameter of the skull. The same degree of penetration (Benoist 9 to 10) as for the antero-posterior projection will give good results, but for this plate the quality of the rays is comparatively unimportant. The exposure need not be more than half so long as for the antero-posterior projection, and there is therefore much less strain on the tube. The plate may be supported in contact with the side of the head and in a plane parallel to the median plane of the skull. The ray which is perpendicular to the plate should pass through the glabella. This projection is comparatively easy to make, and there should be few failures and little breakage of tubes. The knowledge of the antero-posterior depth of the frontal sinus, obtained from the transverse projection, is often useful in arriving at a correct interpretation of the antero-posterior projection. If the sinuses are deep the quantity of fluid they may contain is greater and the shadows cast by the fluid will be correspondingly stronger. When the sinuses are very shallow it will sometimes be impossible to decide whether they contain fluid. It has been proven that an edematous lining membrane will cast as dense a shadow as a collection of pus or other fluid containing the same amount of water, and this should always be borne in mind.

The antero-posterior projection is the one which shows the size and outline of the sinuses and the number and position of their septa, and enables us to ascertain the presence or absence of fluid, either free in the cavity or in an edematous lining membrane. This projection requires the long exposure, and is the one in which the operator is most likely to ruin his best tube, and to lose that cheerful but dignified composure that should always characterize the medical man.

In making this exposure it is important to use rays of as nearly as possible the degree of penetration before mentioned and to maintain them for from 20 to 50 seconds, according to the thickness of the skull and the power of the exciting apparatus. The plate is placed in contact with the face of the subject, and the head as well as the plate and tube must be supported so that there will be no movement during the exposure. With the average skull the frontal sinus will be best shown when the ray passing through the glabella in the median plane makes an angle of about 25° to 28° with the plane of the base of the skull. In making this exposure it matters little whether the patient lie with face resting upon the plate with the tube above and behind, or on a canvas stretcher with tube underneath and plate supported above and in contact with the face. Personally I consider the last mentioned position more convenient, but it requires special appliances which are not obtainable in the instrument shops.

In most cases the proper direction of rays may be obtained with sufficient accuracy by placing the tube so that the glabella, the parietal eminences and the target of the tube are approximately in the same plane, the source of rays, of course, lying in the

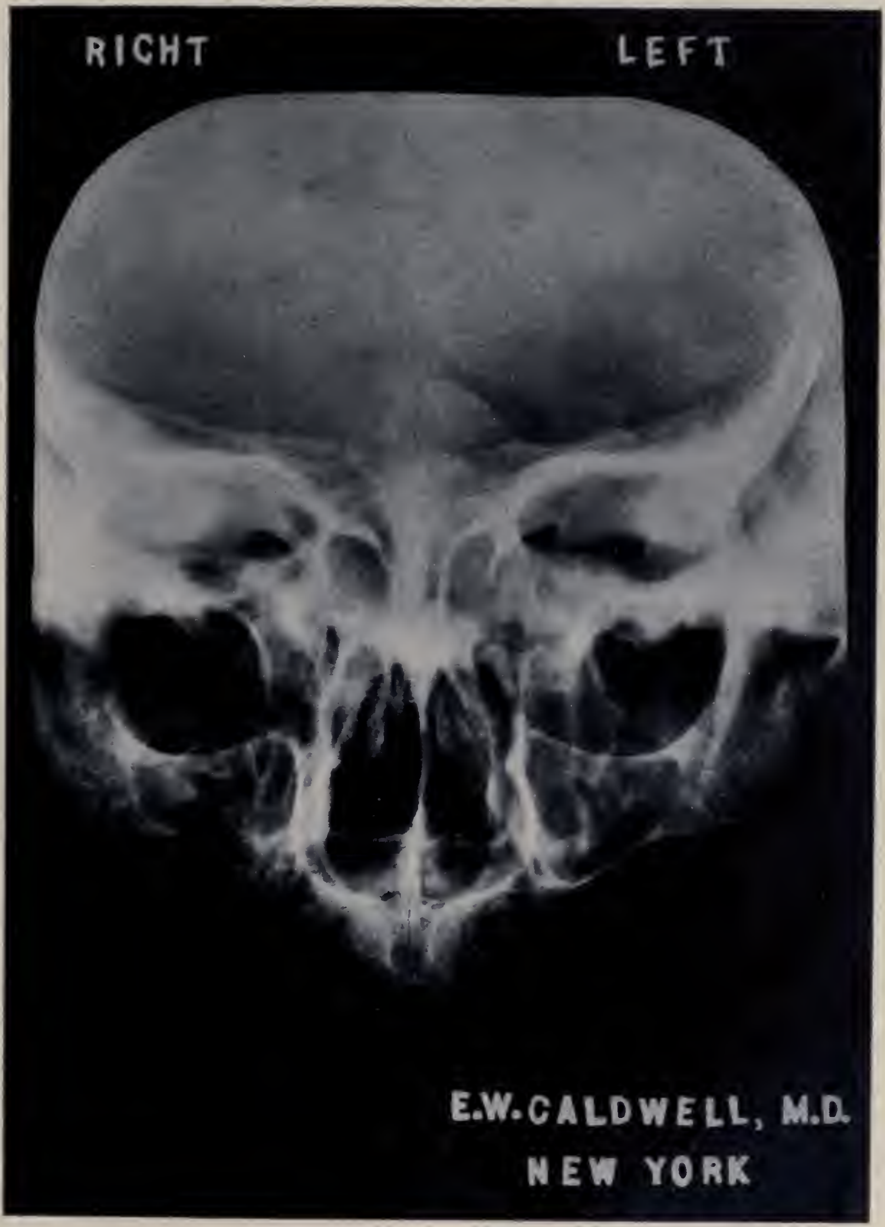

PLATE I.

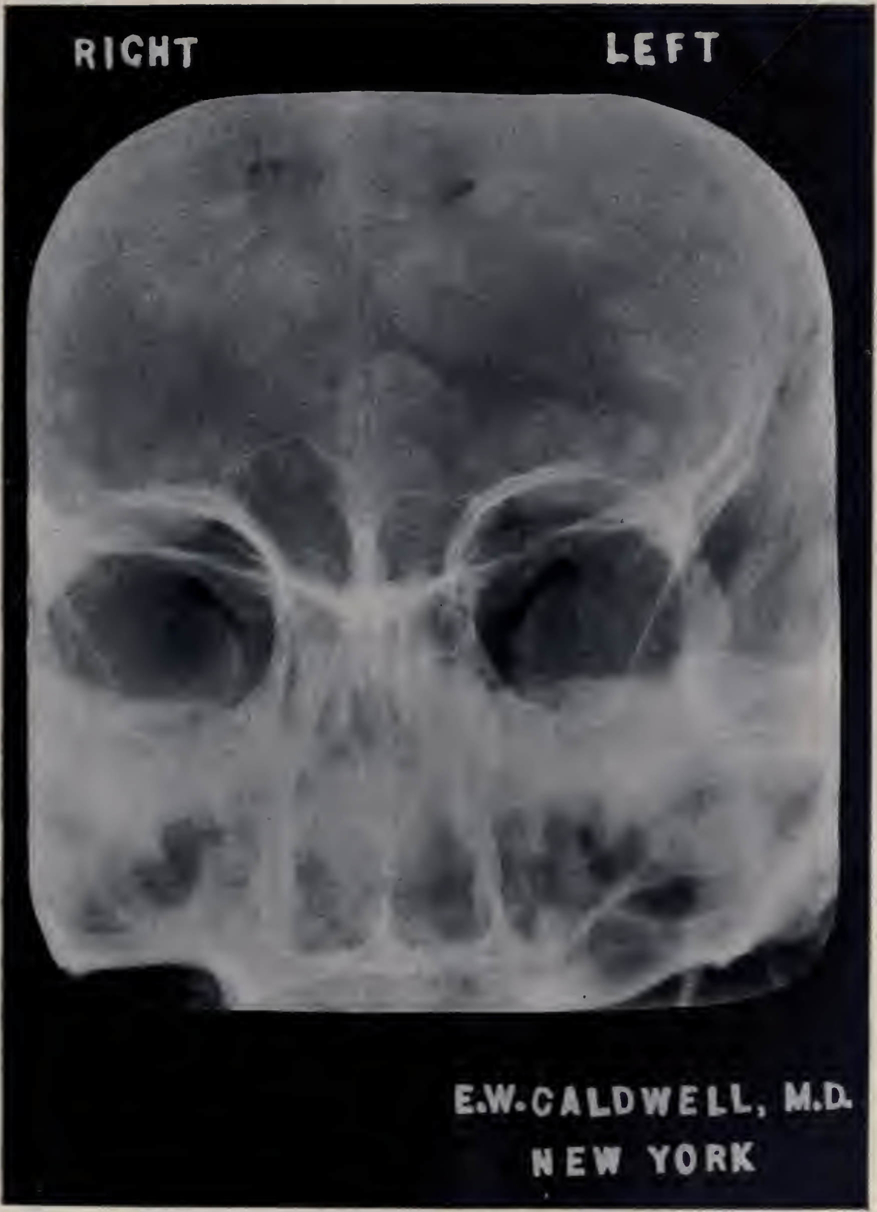

PLATE II.

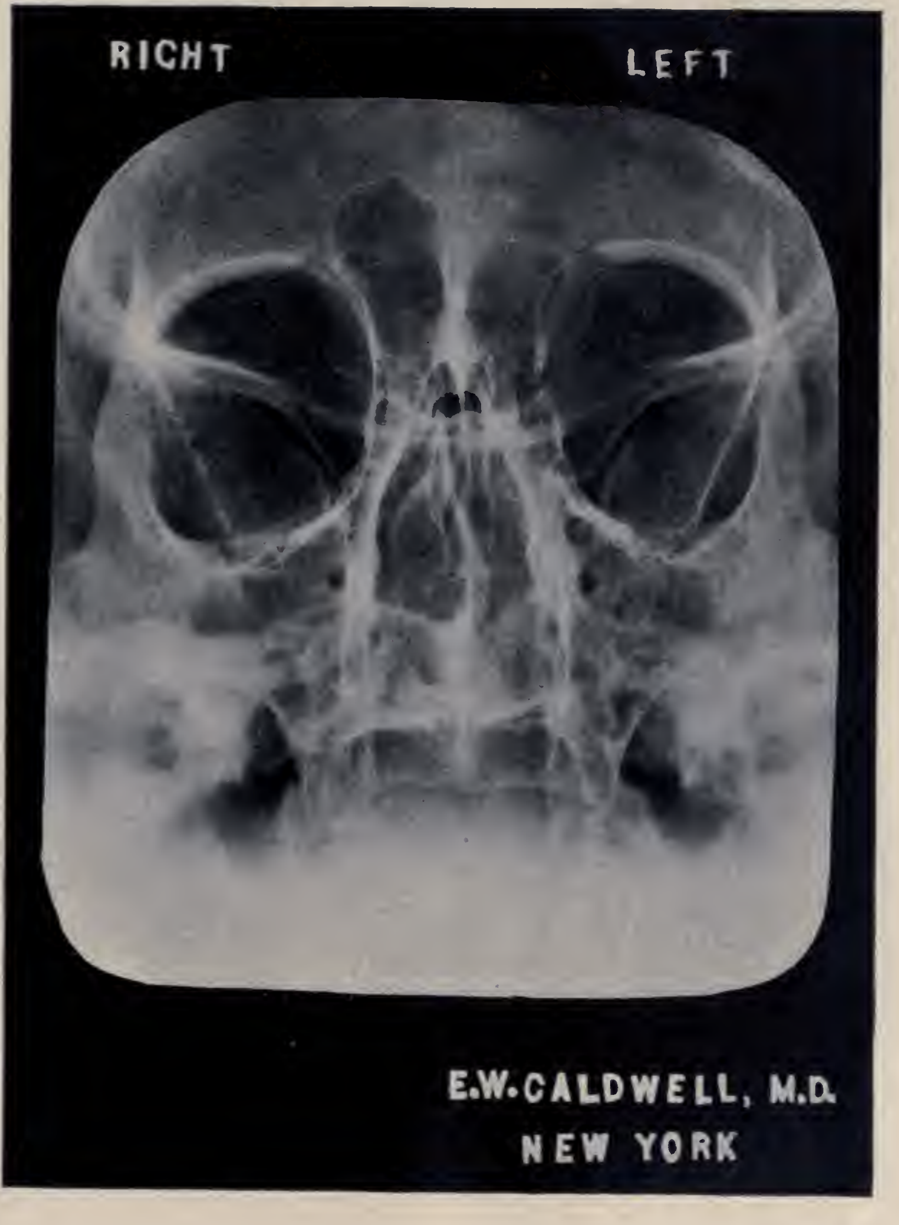

PLATE III.

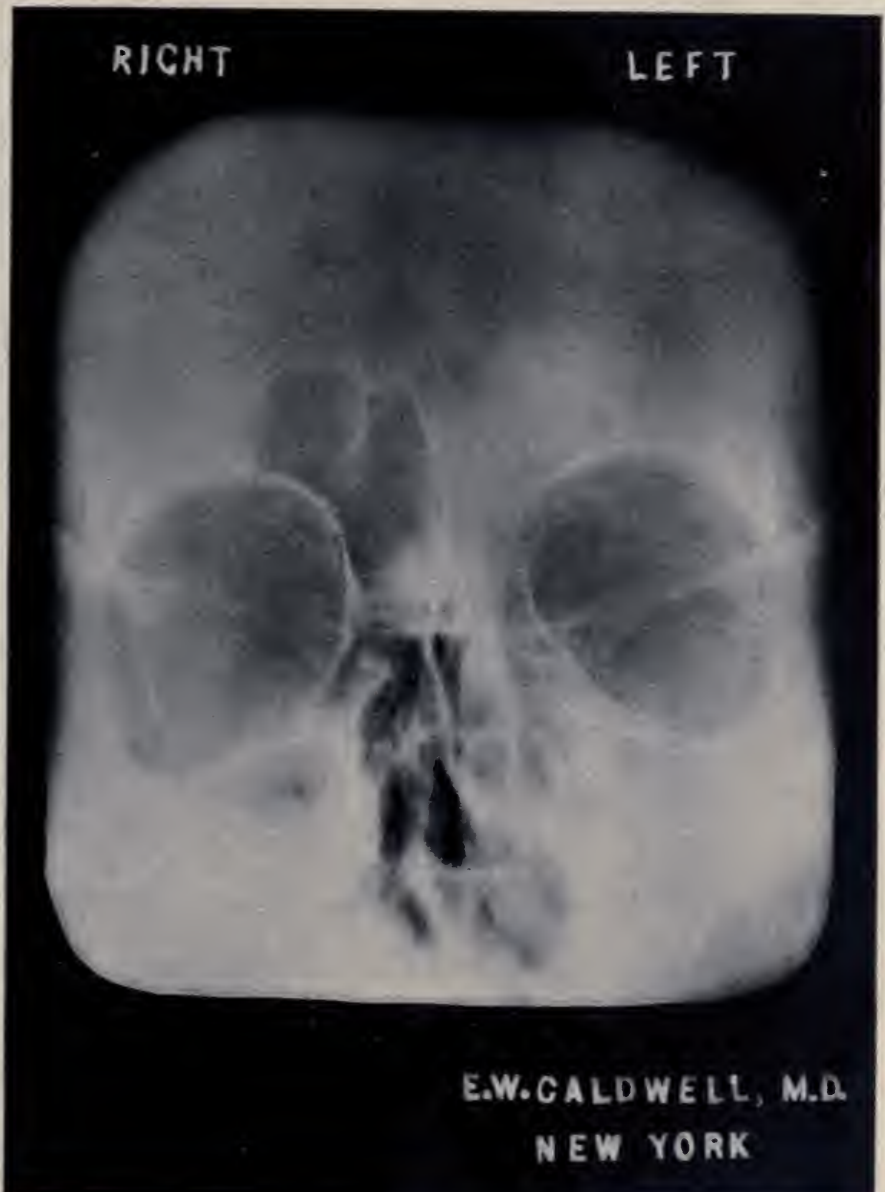

PLATE IV.

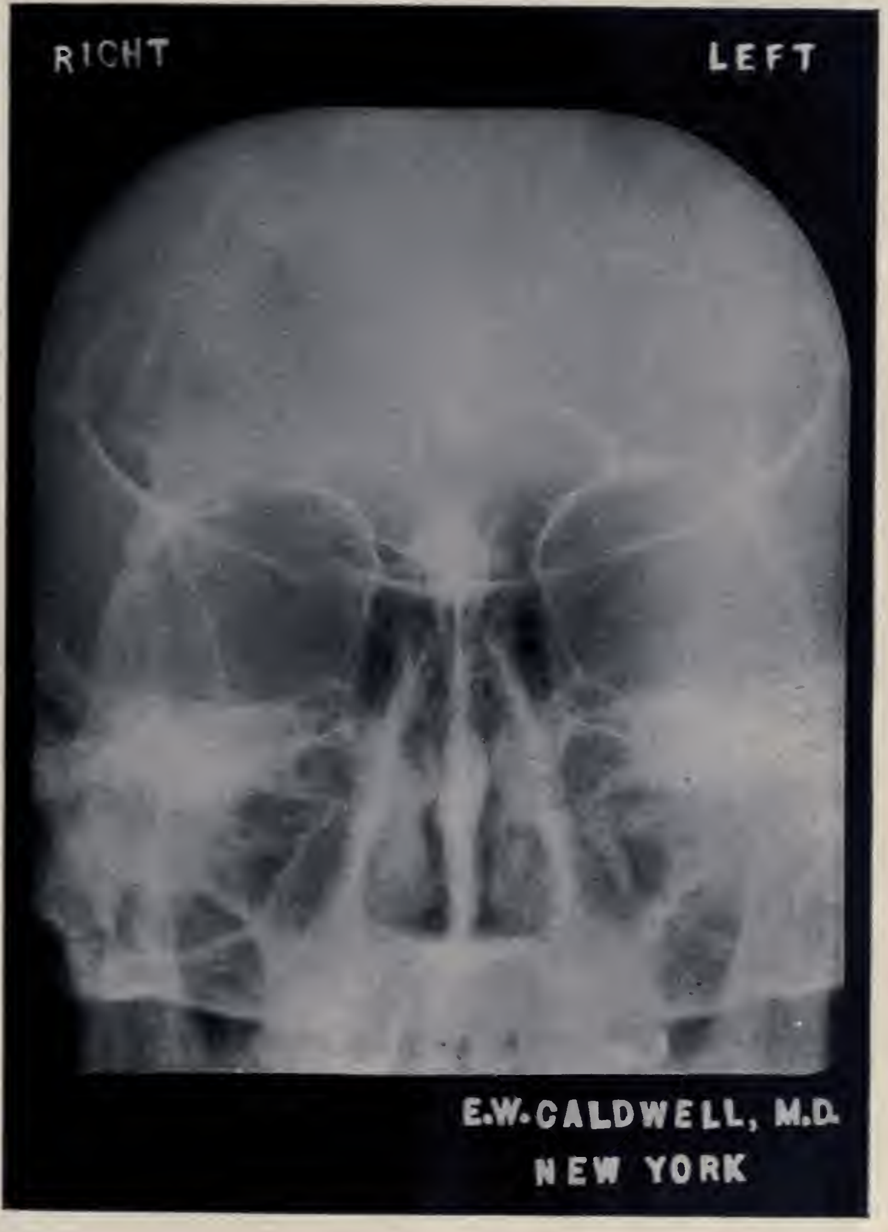

PLATE V.

mesial plane of the skull. Failures seldom result from inaccuracy of this angle, but most of them are due to inability to obtain from the Crookes tube the right quality of rays for a sufficiently long period.

In conclusion I have to say that perhaps this paper has unduly emphasized the difficulty of the work. Some operators have apparently had less trouble with it than I have had. From my own experience, however, I feel fully warranted in recommending that these examinations be made by Roentgen-ray specialists when such men are available. Many rhinologists who do not live in large cities find this impossible, and may employ this method of diagnosis only by equipping their own offices with X-ray outfits and doing the work themselves. The writer hopes that they may derive some help from the suggestions in this necessarily incomplete paper. It is to be hoped and expected that future developments in appliances and technique will remove many of the difficulties that have harassed the pioneers in this field.

No. 480 Park Avenue.

EXPLANATION OF ROENTGEN-RAY PLATES.

PLATES I, II and III.—Three plates of the same skull, to show the effect of different positions of the X-ray tube. In Plate I the shadows of frontal sinuses are almost obscured by those of the base of the skull. In Plate II frontal and maxillary sinuses and ethmoid cells are shown. In Plate III the angle of the "principal ray" is too acute and there is too much distortion.

PLATE IV.—Frontal sinuses slightly asymmetrical. Left frontal and maxillary sinuses and ethmoid cells contain fluid.

PLATE V.—Maxillary sinuses and ethmoid cells normal. Frontal sinuses asymmetrical and slightly cloudy because very shallow.

SOME SURGICAL PRINCIPLES ESSENTIAL TO THE CURE OF FRONTAL SINUS EMPYEMAS.*

BY JOHN F. BARNHILL, M. D., INDIANAPOLIS.

A review of the recent literature of the surgical treatment of the pyogenic affections of the frontal sinus shows that much difference of opinion exists among operators of experience concerning the proper plan of procedure. The varying degrees of severity of the disease that may be present in the sinus, and the several accessory conditions that may occur in a given case, often make the choice of plan debatable, but in those cases of suppuration of the sinus where the symptoms are quite similar in every essential it would seem that too great a difference of opinion exists among operators of apparently equal prominence and experience. Such a difference of opinion is unfortunate for those operators of less experience, who as a result, too often feel a sense of doubt and uncertainty when contemplating the performance of frontal sinus surgery. The diversity of opinion emphasizes the fact that this class of surgery is often difficult, and that ideal surgical measures have not yet been established.

To some extent no doubt the present views concerning frontal sinus surgery are the result of the rather rapid evolution of the rhinologist from a condition of practice in which his chief duty, only a few years ago, seems to have been to cleanse and medicate the mucous membranes of the upper air tract, to that which to-day may require the execution of the most difficult surgical measures, involving not only the nose, but also the more distant and intricate structures of the head and neck. This evolution from the erstwhile rhinologist who was a sprayer of noses, to the present rhinologist, who must be a high type of surgeon, has in some measure been responsible for two sets of operators, viz.: Those who believe that all, or nearly all, cases of accessory nasal sinus suppuration should be treated by the intra-nasal route, and those who hold that while the simple sinus empyemas may usually be thus successfully managed, that when much actual pathological change has taken place in the structure within the sinus or its bony environs external surgery should usually be chosen.

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*Read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, May 23, 1908.—For complete discussion of this paper, see THE LARYNGOSCOPE, August, 1908, page 667.

The discussion which continues between that class of surgeons who maintain, as does Ingals, that ninety-five per cent of all cases of suppurative frontal sinus disease can be cured by the intra-nasal route, and that class which believes that the greatest certainty of cure, and the least danger to the patient lies in the methods of operation by external surgery, calls forth some good arguments in support of their respective beliefs. The intra-nasal surgeon points out in support of his position the alleged facts that ample drainage, and the free admission of air into the diseased sinus will cure all except the worst cases, and that as a result of the concealed operative measures required, no unsightly scar remains. The chief argument of those who prefer external surgery and the only one they consider absolutely necessary to make is, that thereby only can perfect drainage be secured, and the diseased structures be completely removed. The more or less scar tissue which results from external surgery of the sinus, while always an objectionable feature, is by this class of surgeon regarded as a sequence absolutely necessary to a successful issue, and therefore entirely justifiable.

This paper is not, however, greatly concerned in the dispute between the two classes of surgeons, but it is rather with the *surgical* principles essential to the cure of sinus empyema which should govern whichever method is chosen, that we shall be most interested; for both admit that a certain number of all cases of suppurative sinus affection must be operated by the external route, and that a certain percentage is also curable by intra-nasal procedures.

Good results from the practice of any method must depend largely upon the proper application of certain well established surgical principles. Aside from an aseptic technic, which should be as perfect as possible in every case, the principles upon which all successful sinus work must depend, are (1) the complete removal of all hopelessly diseased pyogenic structures; (2) provision for ample drainage of the operated parts; (3) healing the diseased cavity either by a healthy, non-suppurative lining, or by the complete obliteration of the space by means of granulation tissue. The true value of either the external or intra-nasal method of treatment of suppurative frontal sinus disease can, therefore, be excellently judged by subjecting each plan to the standard of requirements of the above principles. Of course, in addition to these principles, the length of time the patient must suffer or be inconvenienced by the necessary treatment subsequent to each and the actual danger to life resulting, although not surgical principles, are nevertheless often the result of the application of correct or faulty principles, and must, therefore, in justice, be considered. Let us apply these principles first to the method of treatment by intra-nasal drainage.

The efforts of operators like Ingals, Halle, Good and others to cure frontal sinus suppuration by the intra-nasal route, and the ingenious devices which they have perfected for entering and draining the frontal sinuses, should receive the heartiest commendation, but seasoned always, of course, by a word of warning to the inexperienced. Undoubtedly a large percentage of cases in which structural changes have not been extensive, and in which the anatomic formation of the sinus is normal can be and are cured by the simple provision thus made for good drainage. When, however, anomalies in the anatomic structure of the sinus are present, and when extensive pathologic tissues have been formed within, drainage alone is not often sufficient to bring about a cure; for in most instances it is impossible to remove the diseased pathologic contents of the sinus, or to correct its anomalous structure by measures directed through the comparatively small opening which it is possible by this method to provide for the drainage. Moreover, in case of the frontal sinus it has been considered a pretty well settled point that it is not possible or safe to enter the sinus with instruments intended for the enlargement of the infundibulum, in a considerable percentage of cases. Mosher (Candidate's Thesis for American Laryngological Association), after a study of the applied anatomy of the frontal sinus in 100 wet specimens, and fifty cleaned skulls, states that it is only by chance that the naso-frontal duct can be catheterized. Turner (Accessory Sinuses of the Nose), says the variations in the frontal sinuses which have been described sufficiently indicate that the passage of the probe through the anterior nares toward the frontal sinus may meet with some opposition. Occasionally a narrow or tortuous duct, or the small size of the ostium frontalis, may prevent the probe reaching the sinus. Beaman Douglass states concerning this point (LARYNGOSCOPE, May, 1904): "One is often mistaken in believing that he has entered the frontal sinus, when, as a matter of fact, his instrument is within an enlarged anterior ethmoid cell" (bulla frontalis). All who have extensively examined the frontal sinus either in the wet or dry state of the skull must have observed that in a considerable percentage of instances an anterior ethmoid cell projects itself into the frontal sinus either external or internal to the sinus orifice of the duct, and that the mouth of the duct lies partially under such cell. In this class of cases, catheterization of the frontal sinus, when successfully performed, must always result in the entrance of the instrument through the broken down ethmoidal cell wall, through which it has been forced. Douglass has, furthermore, pointed out the fact which has also been observed by others, that the internal wall of the frontal sinus, the tabula interna, frequently lies so low above the orifice of the duct that any cutting instrument, even if successfully introduced through the naso-frontal duct, would immediately penetrate the cranial cavity and would most probably set up an effective meningitis. On this point, Mosher states that if there is a sufficient basal relationship between the floor of the frontal sinus and the nose, a burr can be pushed up through the duct into the sinus, the burr running on a probe as a pilot. Concerning this plan of entering the sinus, Mosher further observes that on the cadaver beautiful specimens can be made in this way, but that he is always afraid that the practice of the method will make cadavers of some of his patients. The writer also has a similar fear. The literature of the subject, therefore, clearly indicates that few operators would be willing to place so high an estimate on the percentage of successful cases of intra-nasal enlargement of the duct as does Ingals, who, as previously quoted, states that ninety-five per cent of all frontal sinuses may be safely and successfully entered and drained by means of intra-nasal instrumentation.

It should be stated, however, in justice to the method of Ingals, that his latest instruments and plan of procedure for entering the frontal sinus through the naso-frontal duct are undoubtedly less dangerous than the former ones (Ingals' paper before the New York Academy of Medicine, Section on Laryngology, Dec., 1907), for this operator now passes a guide through the duct into the sinus, next, by means of the X-ray, determines that the position of the guide is correct, and then, when certain that all is safe, drives the burr, which cuts only on its anterior face, along the pilot until the whole course of the infundibulum is enlarged and the sinus is entered.

Unfortunately, the most perfect drainage which it is possible to secure by operative enlargement of the naso-frontal duct, does not always thoroughly drain the entire frontal sinus, and this simple procedure of enlarging the duct will not, therefore, cure every case even though of an uncomplicated, acute variety of sinus suppuration. As evidence of this, several anatomists have especially pointed out the fact that the frontal sinus is often partially and more rarely almost completely divided by osseous septa in such a way as to preclude the perfect drainage of every portion of the sinus, even though the naso-frontal duct be widely open. Thus Hoeve, in an examination of 100 heads (LARYNGOSCOPE, July, 1907), states that frequently an internal set of frontal sinuses was normally present, due to the middle sagittal septae being complete. Hoeve further states that occasionally a superior accessory frontal sinus was present in thick skulls, and that frequently posterior and external accessory sinuses were found during these examinations. The writer has seen one posterior accessory frontal sinus, and two external accessory frontal sinuses in cases of secondary operations which he performed because of failure to cure by intra-nasal methods, and he has frequently found the external accessory sinus present during external operations in primary cases that seemed urgently to demand the surgical interference.

It must be clear to every operator of experience that intra-nasal methods of operation upon the frontal sinus are in accord with but one of the several essential principles of successful surgery, viz.: the provision for better drainage; and that even this principle is often violated because of the frequent pocketing of the sinus as a result of the presence of the coronal or sagittal septae within. It would seem, therefore, that it may be justly stated that there are at least three classes of frontal sinus suppuration that can not be cured by intra-nasal methods. These are: (1) Those in which the inner table of the skull arches above the sinus orifice of the naso-frontal duct so closely that, to enlarge this orifice through the intra-nasal route by means of cutting instruments, would almost certainly endanger the life of the patient because of injury to the dura mater at this point. (2) Those cases in which more or less complete sagittal or coronal bony septa within the sinus prevent good drainage, even though a large naso-frontal opening be provided. (3) The cases in which extensive pathologic changes have taken place in the mucous lining or osseous walls of the sinus.

Having briefly shown the limitations of the intra-nasal method of operation on the frontal sinus, when viewed from the standpoint of surgical principles involved, let us next estimate the value of the external procedure when subjected to examination by the same standard.

By following the external method only can the surgeon hope in any satisfactory measure to carry out the surgical principle of removing in an absolutely thorough manner all the diseased tissue involved. It is the method of certainty in this respect, and not one of guess work. No thoroughly trained surgeon is to-day at all satisfied that he has performed commendable work in the removal of diseased structures unless he actually sees, and therefore knows, that he has in no wise disobeyed this first essential of all good surgery. Concerning the dictum that the most perfect drainage should be provided, it will probably be admitted by most operators that the external method of operating on the frontal sinus is superior in every way, for when either the anterior or inferior wall of the sinus is removed, or when both have been resected, as in the Killian operation, every means of access possible is provided for in the removal of all the diseased structures which will subsequently interfere with the outflow of exudates. The external method furnishes, also, conditions which are more favorable than any other to the healing of the cavity by means of healthy granulation tissue, because, as will be subsequently stated, if this method of operation provides the best means of thoroughly eradicating the disease, and establishes a thorough drainage for the operated parts, it necessarily follows that the most ideal conditions are provided for a healthy growth of the necessary granulation tissue.

The application of well established surgical principles to the external or intra-nasal methods of operation for the cure of frontal sinus empyemas seems, therefore, to offer little ground for good argument in favor of the latter plan of treatment after the disease has long since passed the acute stage, or after it is known in any case that the given sinus consists of a series of compartments, rather than of a single, smooth cavity, all parts of which drain, funnel-like, towards the infundibular orifice.

Which of the several methods of external operation is most ideal when viewed from the standpoint of the application of correct surgical principles? The writer has had most experience with the Killian operation, and with the open method. The procedure devised by Prof. Killian seems more in accord with good surgical principles than any other method in which the external wound is immediately closed, and therefore if a primary union of the external wound is intended it should be the method of choice. This operation is also desirable for the reason that a minimum of scar is produced. Although the Killian operation is ideal in many respects, and especially is this true when the anterior ethmoidal cells are diseased, the writer believes, judging by his own limited experience, that when radical surgery is indicated in the cure of frontal sinus empyema, the desired end is often most certain of attainment by following the so-called "open method" of treatment:—that which has been advocated and extensively practiced by Coakley:—for by this method greater opportunity is offered the surgeon to provide and maintain throughout the whole course of the treatment, the most perfect drainage; to foster by the art acquired by his experience, the natural growth of the necessary granulation tissue: and should perverse or freakish behavior of the granulation structures at any time become manifest, to at once correct and restore the same to a satisfactory and normal state.

The probable deformity resulting from the open method, has, of course, been an insurmountable objection to its employment in the treatment of frontal sinus suppuration, but the writer believes that a careful and prolonged experience in dealing with the processes involved in the healing of osseous wounds, such as the accessory sinuses, by means of obliterating them with healthy granulation tissue, will, in great measure, enable the surgeon to avoid ugly and greatly depressed cicatrices. Perhaps nowhere in surgery does experience count for more in securing esthetic results, than in the case of closure of an osseous wound by the open method. The surgical principle will presently be stated that over-pressure will stunt or kill granulation tissue. Hence if the gauze packing which is commonly used in the treatment of the sinus by the open method is inserted with too much pressure, even though slight, the filling-in process is lengthened to such an extent that the epithelial structures will probably cover the surface of the wound before the granulation tissue has arisen to the skin level, in which event a depressed scar is the inevitable result. A similar outcome may likewise occur from an undue energy on the part of the surgeon in a too excessive or a too frequent repression of the granulation tissue by means of cauterization. A study of this class of wounds during the healing process, and especially a study of the habits and behavior of granulation tissue is, therefore, a very necessary part of the surgical technic, and should provide a satisfactory means of avoiding ugly scars, in many instances, at least.

In a personal experience of more than 500 mastoid operations, and eleven frontal sinus cases treated by the open method, the entire after treatment of which the writer carried out in nearly every instance, opportunity was offered for rather conclusive observation concerning the behavior of granulation tissue under almost all conditions that are likely to occur during the healing of open wounds. The observations thus made have been of great service to the writer in securing a more rapid closure of the frontal sinus, and in avoiding to a great extent the resulting depression and ugly scar. The conditions under which healthy osseous granulation best thrives were noted, as well as the states of the wound which were most favorable to over activity and necrosis of the granulation structures. The growth of this tissue in osseous wounds as thus observed seemed often freakish, and its behavior such that a useful interpretation of the same was frequently impossible. Nevertheless, in the majority of instances its development was most natural and vigorous under the following conditions: (a) When the wound was sterile, or, at least, in a great measure, approached a state of sterility. (b) When the granulations were moistened only with the exudates which were present, but were neither submerged in secretion on the one hand, nor too greatly desiccated on the other. (c) When there was at no time a too pronounced or too prolonged pressure from the gauze or other dressing which had been inserted into the cavity. (d) When the primary operation on the sinus had been thorough in every respect, and the operated osseous wound had been left smooth and free from any pockets capable of retaining subsequent secretion.

With a thoroughly prepared osseous wound as above described, clinical observation teaches that the subsequent behavior of the granulation buds may be entirely controlled at the will of the surgeon, who may, by means of gauze packing or the application of caustics, repress the growth of new tissue, if he so desires, until the whole cavity has been covered with epithelial structures, and the wound has entirely healed, leaving a maximum of depression and scar tissue. On the other hand, it is entirely possible, in most instances, at least, to secure in a satisfactory way, a type of vigorous granulation structure which will rapidly obliterate the sinus by filling it in to a level with the skin structures, which latter are then, and not till then, allowed to bridge across the wound. Healing of the sinus by the open method of treatment will, therefore, leave a minimum of depression and scar tissue, provided the surgeon will exercise that control over the granulation structures which experience has clearly shown may be exercised almost at the operator's will. This desired pliability of the new tissue is based almost entirely upon the surgical principles of efficient drainage, absence of undue pressure upon the granulation buds, and a properly prepared wound to begin with.

Clinical observation of the processes of the healing of bone wounds by granulation also teaches that if adequate drainage is provided, and the wound is secured against exposure to outside pathogenic bacteria, a sufficient degree of sterility will usually be secured to encourage rapid and successful filling-in of the cavity. The surgical principle involved in the provision of such ideal drainage for this class of wound will also insure against the accumulation of exudates and the consequent harmful flooding of the new tissue. In sinus surgery, therefore, successful restoration of the cavity, or its complete obliteration, need scarcely be expected in any case in which the external wound is immediately closed, unless the operator is absolutely convinced that the drain canal he has provided is ample to insure against retention of fluids and the inevitable infection of the same, should they be permitted to stagnate. Even though such an ideal drainage is established at the time of the operation, if immediate closure of the wound is practiced, two things may speedily happen to cause failure to cure. These are, first, the too rapid closure of the drain canal by granulation tissue, and second, the formation of pockets through faulty behavior on the part of the granulation and the consequent retention of pus in the sinus, even though an adequate drainage canal remains intact. This latter condition is one which, in the writer's opinion, is responsible for the failure in many cases which have not improved, and in which secondary operations have, therefore, been necessary. It has already been stated that the behavior of granulation tissue, even when all conditions are apparently normal, is sometimes freakish and unaccountable. For example, the writer has often observed during the post-operative treatment of open wounds in the several head sinuses, that occasionally when all had been progressing perfectly well, if the patient be not seen for thirty-six or forty-eight hours, granulations of unaccountable size would spring up in some part of the wound and grow toward similar granulations in another part with such amazing rapidity, that adhesion between the opposing buds took place, a wall was constructed across the healing cavity, and, before the surgeon was scarcely aware of what has occurred, some portion of the wound was already badly drained, the granulations rank and perhaps necrotic, and unless the faulty conditions thus established were promptly corrected, failure to heal the wound was inevitable. Of course should such an occurrence take place in an open cavity, every part of which can be inspected at any time, failure should not result, because the error is easily detected and corrected; but when the external wound has been immediately closed at the time of the operation, or when intra-nasal drainage only has been practiced, the surgeon can only surmise what is going wrong, and is, therefore, helpless to correct any freaks of healing by granulation, except by means involving a secondary operation.

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Disease of the Scar after Radical Operation. ALEX. IWANOFF. *Archiv f. Ohrenheilkunde*, May, 1906.

Three cases are reported. In one a cyst containing bloody fluid formed in the scar, which refilled after evacuation, and was finally cured by thorough curettage. In the other two cases, cholesteatoma appeared, associated with mycosis. They were cured by appropriate treatment. YANKAUER.

Counter-Rotation of the Eye-Ball Associated with Disease of the Labyrinth. ROBERT BARANY. *Archiv f. Ohrenheilkunde*, May, 1906.

The author investigated the counter-rotation of the eye-ball which occurs when the head is held to one side. He constructed an elaborate apparatus for measuring the position of the head, as well as of the eye-ball, with great accuracy. He examined a large number of persons; normal subjects, patients suffering from disease of the internal ear, and others with labyrinthine symptoms. While the amount of counter-rotation in normal subjects was found practically constant, his conclusions concerning diseased conditions are as follows:

(1.) In unilateral disease of the vestibule, such measurements are of no value. (2.) In bilateral disease of the vestibule, an abnormal degree of counter-rotation can be regarded as only confirmatory of other symptoms. (3.) In patients complaining of vertigo, an abnormal degree of counter-rotation indicates disease of the vestibular apparatus. Normal counter-rotation indicates that the vertigo is due to a neurosis or to simulation. YANKAUER.

THE OPERATIVE TREATMENT OF SUPPURATION OF THE FRONTAL SINUS.*

BY ALBERT JANSEN, M. D., BERLIN, GERMANY.

Mr. Chairman and Fellows, Academy of Medicine:

I thank you sincerely for your kind invitation to read a paper before your distinguished Society, and ask your kind indulgence in my manner of expressing myself in your language.

The change of dates of which I was not aware until yesterday did not permit me to have the translation early enough to read carefully and to become familiar with it.

Through the courtesy of one of your members, Dr. Emil Mayer, I have had my paper translated, and it is but an hour or two in my possession.

I present to you my experiences in the operative treatment of chronic suppuration of the frontal sinus.

The healing process of abscess conditions of the frontal sinus is oftentimes delayed because of the complications in the shape and form of the cells, the many varieties in form and size, and from time to time the extraordinary complications of the ethmoidal cells. For this reason it is very difficult by one method of operating to relieve the conditions existing. To produce a curative effect, and still to keep a cavity in chronic suppurations is extraordinarily difficult. To perform a radical operation of the accessory sinus by way of the maxillary antrum, as was recommended by myself in the International Congress in Moscow in 1897, and there demonstrated, I suggested to enlarge the duct of the frontal sinus by removing a great part of its inferior wall. This relieved the suffering, but suppuration still remained.

My method developed in the following way: In an address presented to the German Otological Society in 1893, I stated that as almost always, in chronic suppuration, the frontal and ethmoidal sinuses were diseased, and often the sphenoid, all of these cavities should be opened at one time, from one opening. The anterior wall of the frontal sinus was generally kept intact, but on the other hand, the inferior wall was removed, and sometimes a small portion of the anterior wall. Then I removed the whole of the ethmoidal and increased the opening of the sphenoidal sinus. The external incision is always made beneath the eyebrow. In consequence, the after treatment was of long duration, and there were many and lasting disturbances of the eye, above all double vision, dislocation of the bulb, squint, and much disfigurement.

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*Read by invitation before the Section on Laryngology and Rhinology of the New York Academy of Medicine on May 23, 1908.—For complete discussion of this paper, see THE LARYNGOSCOPE, August, 1908, page 667.

The after treatment was made much shorter by the removal of the anterior frontal wall, but on the other hand this induced more disfigurement. The removal of the supra-orbital margin produced much bulging of the eye. Diminished vision and double vision remained sometimes for years, and in the meantime the depression of the anterior wall was often enormous.

In order to improve the cosmetic effect and also to hasten the healing process, I made a flap of the bony periosteum of the anterior frontal wall, and after thorough cleansing of the cavity pressed this into it. As the anterior bony sinus wall is often very thick, we can at times get splendid results by this method. In order to improve the appearance, as also the function of the eye which I here attempted, I made a movable small bony periosteal flap out of the supra-orbital ridge in connection with the upper lid. At the conclusion of the operation, I attempted to make this marginal bony periosteal flap assume its original position as closely as possible. This unfortunately was not always possible, as in all these methods the wound was kept open for future dressings. At times but *one* of these flaps was made, but as a rule *both*. Generally I begin the operation by making a marginal flap; and through this make it easier to form the bony periosteal flap of the anterior frontal sinus wall. The operation was performed as follows:

The original opening of the sinus was made just over the margin, not far from the median line, with a small chisel or drill, and extended parallel to the supra-orbital margin, with a Stille's bone forceps or burr or chisel, or a small griiler; then the margin was chiseled through on the lateral and median border and broken down, together with a part of the inferior wall, and then the lower wall was removed. The separation of the bridge follows much better by means of a diagonal sawing, so that the parts may be easily readapted. After making the marginal bony flap it was quite easy with the burr to make a gutter on the lateral and medial edge of the anterior wall from within to the upper limit and to the periosteum, when possible. With the broad bone forceps the anterior wall is quite easily broken through to make the bony periosteal flap. I followed this method for years, in fact, up to 1903 and 1904, and often obtained very satisfactory cosmetic effects. As I always treated these by the open wound method the results, however, were not so good as are obtained by primary closure of the wound with sutures. I present herewith an illustration of the results obtained.

A decided advantage is obtained by primary suture, following the suggestion of Killian. The advantage lies in the greatly reduced time of after treatment, and in the absence or short duration of eye complications. I held out for a long time against primary suture. We always operate in infected wounds. Should the material of infection come from the frontal or ethmoidal cavities between the sutured edge of the wound, the possibility of infection of the lymph canals in the skin is very great, and the danger of an erysipelas is imminent. By very careful attention this danger may be met, and on the slightest indication the edges of the wound should be opened. Having found the advantage of primary closure of the cavity, I then took up a second new suggestion of Killian, namely, the formation of a solid bridge of the supra-orbital margin. I am very much pleased with the results. To obtain the bridge in addition to the use of my method of forming a bony periosteal flap does make the operative technique much more difficult, but the results in maintaining the anterior frontal sinus wall as a bony flap are so much better in a cosmetic point of view, that I recommend it most highly, and do not feel that I could give it up. Through the bony gutter over the margin that I have made I now introduce the burr along the lateral and medial margin of the anterior wall as deep into the bone and as high as possible. This formation of the subcutaneous flap, or limitation of the anterior frontal wall, requires great care. The posterior bony wall of the sinus must not be perforated. This, however, is not so great a danger, as the burr does not wound the meninges, that is, unless too small a burr is used. Having made the gutter of the anterior sinus wall on the lateral and medial sides as high as possible, I then introduce a bone forceps on either side and fracture the wall upwards. At times it becomes possible to use the entire sinus wall as an only flap, but often there remains a bony wall on the upper edge of the sinus cavity, and this is removed with the chisel. The flap is very difficult to make if there are recesses, or if the bone is very thick. In very large cavities the formation of the bony flap is made much more easily and thoroughly when a second vertical incision is made on the lateral end of the curved incision. This vertical incision is always made in lateral fashion from the frontal sinus, running up the skull, so that the cicatrix should not fall into the depression. The incision runs alongside of the lateral frontal sinus edge. Now it becomes an easy process to separate the lateral margin by the use of Stille's bone forceps. The upper part is now drilled with the burr, so that the anterior wall may subsequently be readily broken by the bone forceps. The cicatrix of this incision is barely noticeable later, but the method is made very much easier thereby. This vertical incision is seldom used. I have operated all suitable cases by this method since 1904, that is, 350 cavities in over 300 patients; the result has been entirely satisfactory both to my patients and also to myself. I present to you herewith a photograph of a patient at the time of operation and two days after. In this instance there was a very large and deep frontal sinus, and the result is, as I may mention, just the same subsequently as in the present photograph. This method then is a combination of my original radical operation with the two new suggestions of Killian, namely, the bridge formation and primary suture. According to the other above-mentioned methods I have performed about 500 operations on the frontal sinus, making a total of about 800 operations.

It seems to me more important to enumerate the disadvantages than the advantages of a method. Thus we must bear in mind the opening of the anterior cerebral fossa, the opening of a healthy sinus of the other side, the remaining of infectious material, sequestration of bony flap or bridge, the difficulty of performance, and especially the increased danger of infection as a result of the long use of the electric drill. I make use of the burr to form the bridge and to smooth the same, to remove the lower sinus wall and to smooth the posterior wall. All these dangers may be prevented, except the formation of necrosis, which occurs very rarely. The formation of the bridge alone is often sufficient to start the recurrence; especially on the medial edge a cavity remains that is filled at times with granulations, discolored granulation tissue, and a development of these discolored granulations is often noted along the bridge; these granulations grow either from the nose, below the bridge, or from the medial ethmoidal cells at the base of the nose.

The bridge of Killian at times prevents the free opening of the lower part of the frontal sinus and the proper removal of the ethmoidal cells. The technical difficulties may at times in complicated cases become extraordinarily great; this is the part of the operation that may be even dangerous to life. I use the burr even more than formerly.

Of the greatest difficulty is the removal and exposure of small ethmoidal cells that lie posterior to the radix nasi and to the frontal sinus. The further backwards and laterally the inferior frontal sinus extends, the more difficult is the exposure of these ethmoidal cells, especially as they occur, as a rule, in a very flat form. They are always diseased, and their exposure is necessary. I have seen death follow as a result of diseased conditions following non-exposure of these posterior cells.

The timidity at first becomes less when we bear in mind the exactness that is necessary here to remove all diseased conditions rapidly, surely and thoroughly.

May I again call attention to the fact that the bone of the base of the cranium is hard, solid, thick, non-translucent, and of a yellowish-white color. The bone covering the ethmoidal cells, however, is thin, transparent, and has a bluish appearance because of the underlying diseased mucous membrane. A slight touch of the chisel, the curette or hook is quite enough as a rule to perforate the bone. This is a most important point by which we can differentiate the bones of the ethmoid or accessory cavities in general as against the bone of the cranium, which latter never shows a bluish hue. In the removal and curetting of the ethmoidal cells at the base of the cranium quite some force may be used, the cranium readily withstands it, and the ethmoidal cells are rapidly and thoroughly removed thereby. Rather frequently there are found in the upper portion and on the side of the root of the nose, median ethmoidal cells filled with diseased mucous membrane, communicating with the other side. The exposure of these cells becomes more difficult when the bridge is formed, and is still more difficult the broader the medial edge of the bridge is maintained. This region, gentlemen, I studied with care.

If certain cells are left behind, recurrence begins here along the bridge or below my bony periosteal flap, or, as may also happen, and as I believe to have noted myself, an infection of the opposite side. I have learned in late years that the cells may be freely removed in this vicinity, even though it is known as the dangerous zone, as a result of the closeness to the lamina cribrosa and to the nerve and lymph tracts. After a thorough removal of all ethmoidal cells in this area, sometimes the conditions are favorable for recurrence, nevertheless.

To avoid sequestration of the bridge the periosteum is left adherent. Operation is made more difficult thereby, as after the cutting of the periosteum above the margin hemorrhage occurs, which renders the separation of the bone above the margin much more difficult. To find the exact point of the beginning of the bony gutter is thereby rendered more difficult. The operation is rendered less difficult if the whole periosteum is drawn up from below over the margin at one effort. If one desires to make the operation an easier one it would be well to follow this plan.

The burr has been of much benefit in smoothing the bony flaps, and if anywhere there is a diseased bony substance shown by hyperemia and roughness of the surface in the frontal sinus, I smooth it in careful manner with the burr.

Perhaps I do not take up too much of your time in calling your attention to the few other points in relation to some of the unlooked-for difficulties of the operation. It is very rare that we find a smooth and regularly built cavity. Most frequently the upper medial recess is separated from the rest of the frontal sinus by a bony partition. Very often there are a number of bony walls mostly vertical, at times also horizontal, by means of which the entire cavity has separate partitions. The formation of my bony periosteal flap is made much more difficult as a result of this, and oftentimes it may only be made by means of the lateral vertical incision. Then these walls may readily be removed by means of curette, chisel, burr and Stille's bone forceps. In a high square cavity this cut is very practical.

An incorrect idea of the size of the frontal sinus may follow because of the division of the sinus in two parts, one above and the other below the margin. This occurs as a result of a horizontal bony wall, which lies on a level with the bridge, usually before its lowest edge, and showing only on its medial end a small opening between the upper and lower frontal sinus division. The formation of the upper frontal sinus is rarely quadrilateral, usually three-cornered, with a more or less rapidly descending lateral wall, and in this form there is also difficulty in forming the bony flap. *This bony wall is at times very thick.*

Recurrence and many annoyances may be occasioned by the presence of a recessus, which occurs at times in the upper region of the septum. I am enabled to show you in this illustration such a recessus accidentally found. Superficially examined, this would look as if a perforation existed to the other frontal sinus. The extension of the diseased frontal sinus over toward the healthy one is an annoyance, the operation being made more difficult thereby, although we have seen in some cases of this extreme projection prompt healing by first intention retaining the entire anterior wall. The upper and posterior ethmoid cells sometimes bulge into the frontal sinus. These must not be mistaken for an irregularity of the capsule of the cranium, as the opening of this bulging ethmoid is of great value toward a definite and rapid recovery. The thin, bony covering shows it easily as belonging to the ethmoid cells.

Formerly I began the opening of the frontal sinus above the margin; now and for a long time I rarely begin in this manner. I begin almost always to open the ethmoid cells from below; in this opening, after the removal of a part of the processus frontalis of the maxillary bone and the lamina papyracea, I open the lower frontal sinus cavity by the removal of the lower wall of the frontal sinus. It is not always easy to tell in advance whether in the removal of the bone on the medial and orbital border the frontal sinus has already been opened or we are still in the ethmoid region. Mistakes have frequently occurred and are very possible. It is not always possible to locate the frontal duct from this point, and I have not always been able to follow it. As a rule it may be decided by means of the probe whether we are in the large ethmoid cells extending under the frontal sinus, or in the lower portion of the sinus itself. Except for these difficulties the opening from below has its distinct advantages. We must not, however, go too close to the margin, lest we may interfere with the bridge which we wish to form. If the frontal sinus is healthy a small opening may not do harm.

Up to recent times we knew nothing about the form and shape of the sinuses before the operation. By means of the transillumination we got a sort of a rough idea. But of late years by means of the Roentgen rays we have been enabled to get a clear idea of the form, size and position of the frontal sinus, but even now at times it becomes very difficult to determine, even with a very good Roentgen plate, whether a sinus exists or not. To be very exact, we must have also a frontal and two transversal illuminations.

Operating from below, we come to the conclusion very rapidly. By superior operation above the margin we are often compelled to chisel away very deep in the skull before we reach the conclusion that there is no frontal sinus. The disappointment, after many unsatisfactory attempts disclosing a healthy dura in place of a diseased mucous membrane, is exceedingly depressing.

Another point of great value in favor of operating from below is that it occurs not infrequently that a diseased condition of the mucous membrane of the frontal sinus in the floor of the sinus is disclosed. This is a point of great importance for the diagnostician as also for the operator. We have all suffered under the difficulty of forming an exact diagnosis of the condition of the frontal sinus, and oftentimes we could not reach conclusions without doubt. In many cases we believed ourselves to be entirely sure, sure of a diseased condition of the mucous membrane without a doubt, and then when the opening was made above the margin we saw an empty, healthy frontal sinus cavity, and, gentlemen, we really were not so wrong as it would seem at the first glance. The frontal sinus was in its upper portion normal, but not always entirely, and in its lower portion was often found to be very seriously diseased. We must therefore in the frontal sinus not only think of the conditions as existing in the upper portion, but also of the conditions in the lower. According to my experiences the prevalent diseased condition of the mucous membrane on the floor of the frontal sinus is not so unusual as it would seem to be from the lack of mention thereof in the literature of the subject. These conditions are very often possible of demonstration after the opening of the lower portion of the frontal sinus. In such cases the mucous membrane on the posterior frontal sinus wall is less reddened and swollen in the region of the margin, and appears at times quite white and thin and shining. If the mucous membrane in the neighborhood of the margin is healthy or nearly so, we may be quite confident of a cure as a result of operation. Chances of recovery are still greater in these cases than if we made a counter opening above. My experiences as to what is useful and harmful are still too few to enable me to reach a definite conclusion, but I would like to call attention to the fact that I have seen an almost normal frontal sinus above the margin with diseased cavity below, followed by severe affection of the upper portion after having made a probatory opening above the supra-orbital margin—and have seen prompt recovery follow the opening of the lower portion of the frontal sinus, if I thoroughly opened and cleaned out only the inferior cavity. If the upper portion above the margin is found to be normal we must not therefore cease operating, that is, if an indication for operation previously existed. We must then open up the lower portion, or better still, we begin from below to open up.

We may anticipate these conditions by the use of electric transillumination and the Roentgen rays together. If the transillumination shows more or less darkening in the vicinity of the supraorbital margin, and above and below the margin, large cavities are diseased. These cavities may represent a very large lower frontal sinus recessus, or below a small sinus a large ethmoidal cell. If the upper sinus is healthy, the Roentgen picture in such a case would hardly show a shadow as in general the upper portion showed it. If, however, the upper sinus in the Roentgen picture is hazy and dark, and if there is a rather negative find in the transillumination, we are justified in concluding that the lower recessus is small and surrounded by a healthy ethmoidal cell.

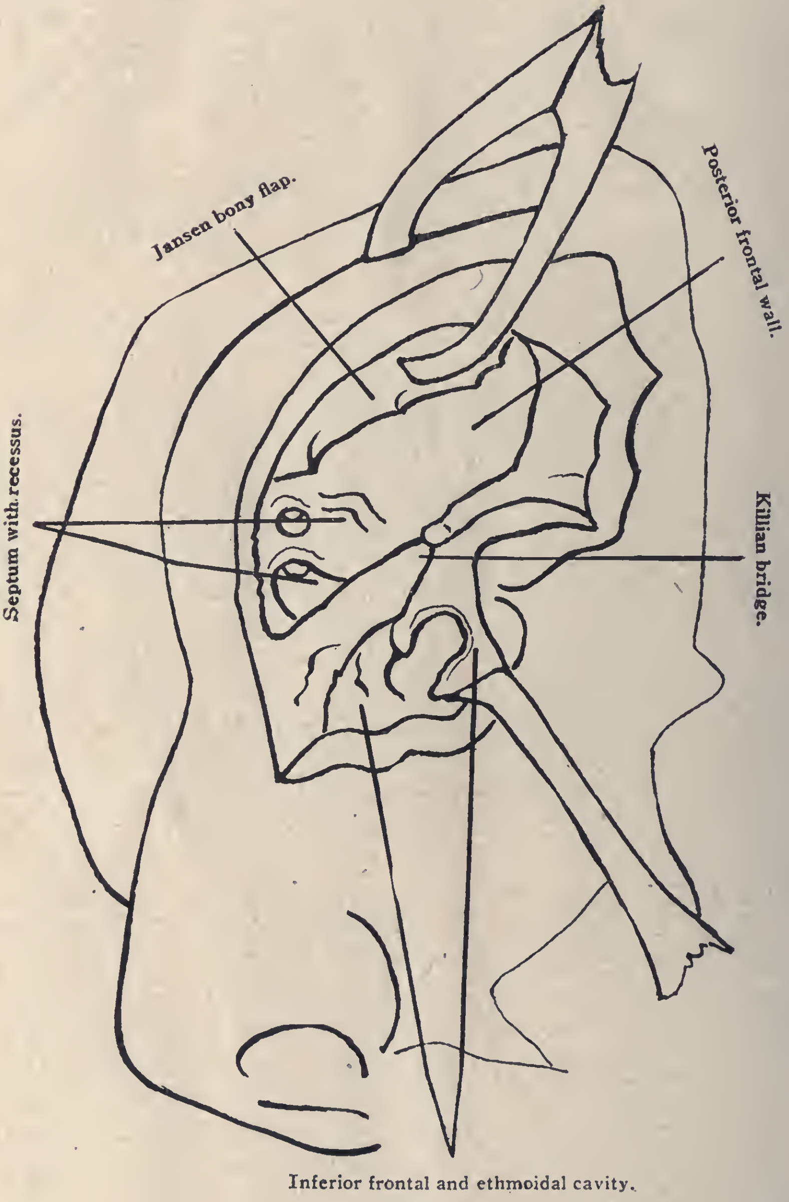
I would like to call attention briefly to another difficulty coming as a surprise in the operation, but for which as a rule we are prepared. I refer to the existence of a perforation of the septum with disease of both frontal sinuses, while but one side was diagnosed as affected. This occurs particularly in cases of one-sided discharge and closure of the other frontal sinus orifice, for instance, by ossification. We become suspicious of this condition, however, when by transillumination there is an equal absence of light on both sides, or when on the Roentgen plate both sides are equally shaded; sometimes the X-ray profile plate gives us ample knowledge before operation. If the relations of the ethmoid and sphenoid, even of the frontal cavity, are not too difficult, the operation of both cavities from one side is the most practical. I remove the septum, as a rule, even if the other ethmoid side is normal, draining the cavity through the ethmoid. The retention of the septum often practiced by me in cases of double abscess disease may be of advantage from the cosmetic point of view, which the formation of the nose and forehead will show.

The ethmoid is extraordinarily variable in form and size. Even in the greatest extension of the ethmoid I have been enabled to remove it entire. This I consider as a necessity to secure an assurance of complete cure.

The sphenoidal sinus is affected with extraordinary frequency in disease of the ethmoid, but not absolutely always. A careful inspection is necessary, but unfortunately, on account of the excessive hemorrhage that occurs, this is more easily said than done. Nevertheless, in many cases we are enabled to note the condition of the sphenoidal sinus with some exactness. If it is diseased I remove the whole anterior wall of the sphenoidal cavity. This is done with the aid of long gouges and curettes. I follow with extraordinary care the sphenoid cavity to its final lateral end. For a long time, however, I have not been satisfied with this alone. In the after treatment much difficulty arises because of the closure of the sphenoidal wound, where the wall was removed, by a membranous band becoming ossified. This retards recovery, and to prevent this I have not only removed the anterior wall, but also the lower wall. This removal of the lower wall is much more difficult than the anterior, as the bone of the lower wall is very much thicker and at a greater depth.

So for a long time I have often included the opening of the maxillary antrum with the opening of the ethmoid cells through the same wound. After the removal of the ethmoids, the opening of the maxillary antrum is exposed, and very frequently is clearly seen in all its breadth. In this way the medial maxillary antral wall is readily removed with the curette, followed by the use of the gouge, and thus the granulation, polyps and thick pus masses may be removed from the maxillary antrum without opening the same anteriorly. In many cases this is of advantage, though I will not recommend it in that the affections may not be followed by complete recovery.

A word should be said on the relations of the middle turbinate. In most cases I do not remove the middle turbinate. It remains


Jansen bony flap.
Posterior frontal wall.
Septum with recessus.
Killian bridge.
Inferior frontal and ethmoidal cavity.

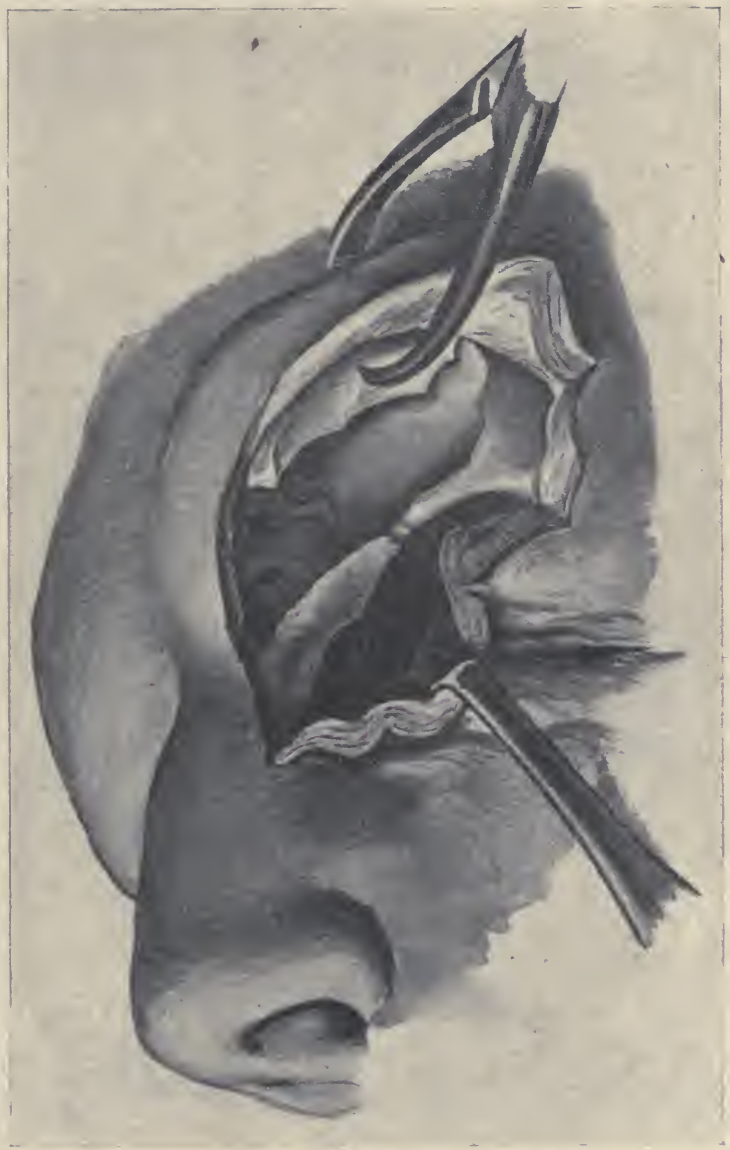


Plate illustrating Dr. Jansen's technique of the radical frontal sinus operation.

if not degenerated, and where I wish to preserve the sense of smell. In those cases where I wish to retain a thorough view of the ethmoid, frontal and sphenoid region I remove the middle turbinate.

As regards perforation into the cranial cavity, this occurs extraordinarily rarely in my cases. I have had it occur a few times, but saw no reason to modify the method of operation. I recall one case of perforation from the frontal sinus, and also from the ethmoid into the cranial cavity with pachymeningitis externa. I was enabled to free the diseased dura from the healthy part, curette the granulations, and conclude the operation as in all the others, but without complete primary closure. Recovery was prompt, but the primary closure of the wound was not attempted. In such cases the marginal bony flap may be used advantageously.

After concluding the operation the parts are thoroughly cleansed of blood and splinters of bone, any diseased mucous membrane is removed, and iodoform gauze is introduced. The latter, in order to prevent pressure upon the bulbus, is made long and small, then follows the closure of the wound with the Michaels metallic clamps. As a rule, after twenty-four hours, and sometimes only twelve, I remove the clamps and gauze through the nose, satisfying myself that the upper end of the gauze, which was hemmed, was removed. It has happened that the gauze strip has became torn and the upper edge remained in the wound; after a few weeks an abscess occurred, requiring opening up and removal. This has recurred sometimes, and at first I did not understand its meaning, believing that the gauze was left behind at time of operation, and only accidentally found that the gauze was torn in removal. By sterilizing this with superheated steam the gauze becomes soft, and hence tears easily. I then have a bandage placed, and leave this for eight days, so as to exert pressure on the bony flap against the underlying part. Further treatment is not necessary. I do not wash out the nose for some weeks.

I apply the different methods of operation—it is always the radical operation on the frontal and ethmoidal, often also the sphenoidal sinus—according to the following indications:

I. With young children and adults having a very small frontal sinus, no plastic procedure being necessary, I remove the anterior and inferior wall, including the supra-orbital margin; a procedure for a great many years practiced by me; my old operation.

II. With older children or adults, having somewhat larger cavities, I perform the operation by forming the anterior bony flap, according to my procedure practiced for several years.

III. Should the cavities be still larger (though in any case small), I form the Killian bridge, removing the anterior and inferior wall and, if necessary, filling the cavity with a piece of paraffin.

IV. Should the cavities be rather extended, I form both the anterior bony flap and the Killian bridge. This is my standard operation since 1904.

V. I form two bony flaps, the anterior and the marginal, if primary closure is impossible, as well as a solid bridge, for instance in endocranial abscess, or in phlegmon, or if the operation must be performed as rapidly as possible (in weakness of the heart, etc.). The same method is indicated if the operator's experience should be insufficient to overcome the difficulties accompanying, in extraordinary anatomical conditions, the formation of the Killian bridge.

Hardenbergstr. 12.

A Case of Neurofibromatosis (Recklinghausen's Disease) with Involvement of the Ear. VICTOR HAMMERSCHLAG. *Monatssch. f. Ohrenheilkunde*, May, 1906.

In addition to the neurofibromata scattered throughout the body, there was present in the case reported by the author a subcutaneous angiomatous tumor in the temporal region and cheek of the right side, and a defect in the alveolar process of the right upper jaw. Radioscopy showed that the bones of the right side of the skull were exceptionally thin and the accessory cavities large.

The condition of the right ear is of especial interest. There was an entire absence of the cartilage of the external canal and tragus, so that the cartilaginous part of the canal was collapsed, and at its junction with the bony part there was stenosis. There was diminished hearing, especially for low notes. Weber right, Rinne positive. Catheterization improved the hearing, but the procedure was difficult, as it was not always possible to find the orifice of the tube with the catheter. The author believes that this was due to an absence of the cartilage of the tube. A certain asymmetry of the vault of the pharynx and of the soft palate seems to substantiate this view. YANKAUER.

SOME VARIATIONS IN THE ANATOMY OF THE FRONTAL SINUS.*

BY JOSEPH P. TUNIS, A. B., M. D., PHILADELPHIA.

The greater the number of specimens examined the more one is impressed with the wide variation in extent and capacity of the frontal sinus. Among over a hundred human skulls which I have recently examined, the capacity varied from 1.2 cc. to 28.4 cc with all possible intermediate gradations. In this series of one hundred anatomical specimens, the sinus was absent in only one. (Fig. 1.)

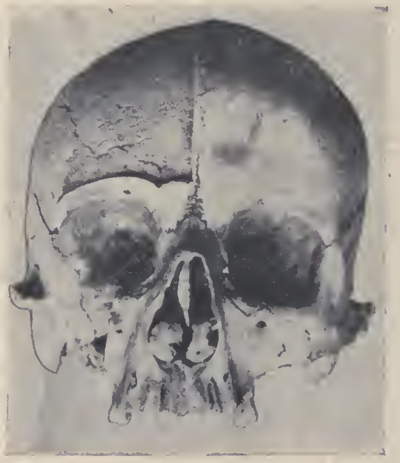


Figure 1.—No frontal sinus. The outer table of the skull has been removed on the right side to show the diploe.—From a specimen in the Wistar Institute, Philadelphia.

Half of this series was secured from the dissecting room of the University of Pennsylvania, and the other half from the excellent collection of skulls at the Wistar Institute. Included among the latter, numbering one hundred and seventy skulls, were specimens from India, Borneo, New Zealand, China, Japan, Africa and Alaska. Most of the museum specimens I was only able to examine by transillumination. As all of this material represents the lowest possible type of skull, it is fair to presume that such variation would be greater in the higher and more intelligent types.

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*Read before the Section on Otology and Laryngology of the College of Physicians of Philadelphia, May 20, 1908.

According to Holden[1] the points of interest about the frontal sinuses are: "1. That they communicate freely with each nostril through the 'infundibulum,' hence it is possible for foreign bodies to lodge there. 2. As they are lined with a continuation of the nasal mucous membrane we have a ready explanation of the aching pain in the forehead in cases of influenza, or a common cold in the head. 3. In cases of fracture of the base of the skull, involving the walls of the cells, it is possible for fragments of the brain to escape from the nose. 4. If the outer walls of the cells be injured by violence or disease, the air, in sneezing or coughing, is liable to escape under the skin of the forehead; causing 'surgical emphysema.' 5. They not only contribute to the lightness of the skull, but increase the resonance of the voice. They do not begin to be developed until about the second year, and steadily increase in size afterwards. Even in Europeans their size and extent vary exceedingly. * * * In old persons, as a rule, when the sinuses enlarge, it is by the inner table encroaching on the brain-case. The skull wall follows the shrinking brain."

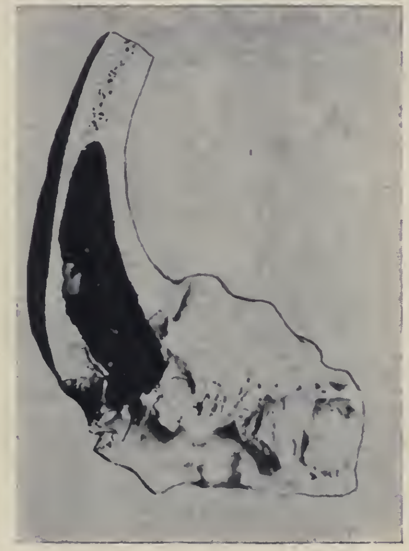

Figure 2.—Sagittal section of adult frontal bone, with ethmoid attached, to show space between anterior and posterior wall of frontal sinus. —From a specimen in the Wistar Institute, Philadelphia.

While a resident at the Episcopal Hospital I saw three cases of fracture of the outer wall of the frontal sinus without injury to the inner and more brittle one. One of these was a boy of four years; the second case a boy of 14, and the third an adult. All three made an uneventful recovery. Such cases are not infrequent in surgical practice, and illustrate the very considerable space or air cushion, antero-posteriorly, between the two walls of this sinus. (Fig. 2.) As to the age at which the frontal sinus develops, I have only been able to examine half a dozen skulls of children; their ages ranging from two to six years. Of these the specimen I show you (Fig. 3) is presumably that of a child from five to six years old, judging from the condition of the unerupted teeth. This child has a well marked frontal sinus on the right side and also a decided sphenoidal sinus. The other five juvenile specimens showed no frontal sinus at all.

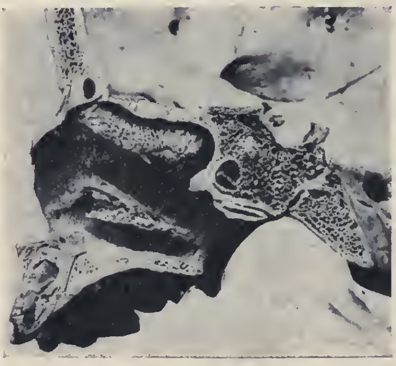

Figure 3.—Sagittal section from a child of five years. Note the frontal sinus, the sphenoidal sinus, the thinning out of the cancellated bone in the sphenoid, and the unerupted canine teeth.

Logan Turner,[2] from an examination of over five hundred skulls, gives the following measurements for a sinus of average size;—height, 31.6 mm. (1¼ in.); breadth, 25.8 mm. (1 in.); and depth, 18 mm. (¾ in.). Three diameters were taken for this purpose, namely, the vertical height, from the fronto-nasal aperture vertically upwards; the transverse breadth, from the mesial septum horizontally outwards; and the antero-posterior depth, from the lower end of the fronto-nasal suture backwards along the orbital roof. (Fig. 4.) "In estimating the height of an unopened sinus, however, it will be found that the lower end of the suture between the nasal process of the superior maxilla and the frontal bone sufficiently indicates the position of the ostium frontale." "The ostium frontale is always present. This is readily understood when we remember that the sinus is developed by an upward extension from the ethmoid labyrinth. As the result of measurements which I have made in a large series of macerated skulls, the opening was found to vary from a mere slit which would not admit the point of a very fine probe, to one measuring 7x8 mm. The average diameters were found to be 4x3 mm."

"The smallest cavity met with (by Logan Turner) measured in height 18 mm. (¾ in.), in breadth 13 mm. (½ in.), and in depth 5 mm." A glance at specimen No. 22 or No. 23 will show that

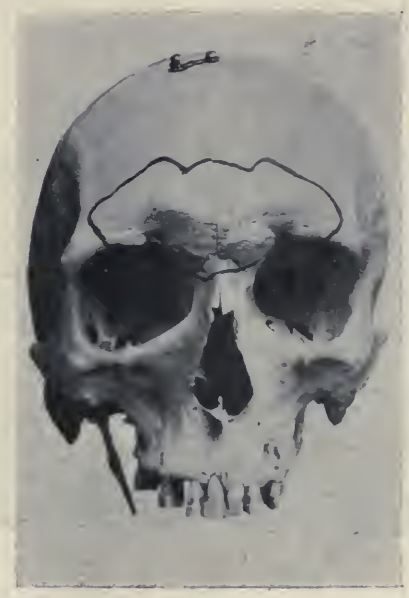

Figure 4.—Skull No. 9. Outline of a frontal sinus of more than average capacity.

these are much smaller ones. In specimen No. 22 the frontal sinus extended upward and backward half an inch while in specimen No. 23 these measurements were reduced to a quarter of an inch in each direction. Neither of these specimens showed any vertical extention of the sinus above the supra-orbital ridge. The largest sinus (of this same observer) bounded internally by a mesial septum, extended as far outwards as the external angular process of the frontal bone.—Height, 45 mm. (1¾ in.); breadth, 60 mm. (2½ in.); and depth, 25 mm. (1 in.) A sinus with a greater vertical diameter than the above was, however, met with; its cavity extended upwards in the forehead for two and a half inches. In another skull, again, the sinus extended backwards almost as far as the optic nerve."

Among my specimens, skull No. 5 (Fig. 5) gives some greater measurements than the largest of Turner's. Unfortunately the calvarium of this skull was missing so that the vertical diameter could not be accurately determined. Laterally the measurement is three and an eighth inches; antero-posteriorly, on the right side, one and three quarters inches; while vertically it extends at least two inches upward. Note the extremely thin anterior wall of this sinus on the right side and the poorly developed supra-orbital ridges. In this specimen there is also a gigantic sphenoidal sinus extending outward to the extremities of the greater wings of that bone. Unfortunately I have no data concerning this skull. It is merely a dissecting room specimen.

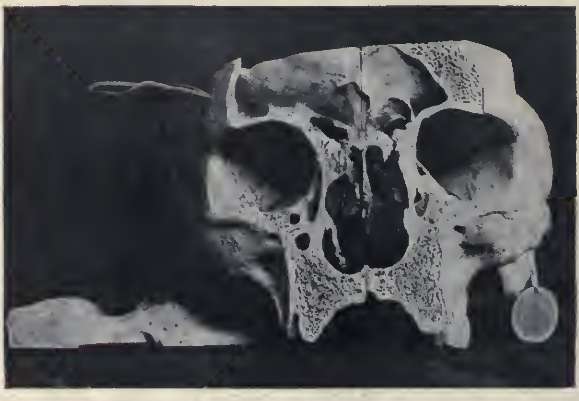

Figure 5.—Skull No. 5, with thin anterior wall to frontal sinuses, extending laterally to the external angular processes of the frontal bone and measuring 50 mm.x37 mm.x50 mm., over right orbit. The combined capacity was 190.3 grams, or 28.4 cc.—From a specimen in the Wistar Institute, Philadelphia.

Dr. M. H. Cryer[5] has described a specimen where the sinuses were even larger, and Onodi[4] has an X-ray picture in his book of a frontal sinus which extended vertically 80 mm., or 3 1-5 in. from the supra-orbital ridge to within 4 cm. of the coronal suture. This sinus had the greatest vertical diameter of any I can find reported in the literature of the subject.

In examining the thirty odd specimens I have the pleasure of showing you to-night you will see that there is only a very small sinus on the right side in specimens No. 22 and No. 23. The actual capacity of the former, measured by pouring in small shot and then weighing it, is 1.2 cc., while the capacity of the sinus in skull No. 5 was 28.4 cc; specimen No. 24 being second best, having a capacity of 16.8 cc. The shot used for this purpose was the smallest I could get, namely No. 12. By determining the equivalent in cc. of each gram of shot it was found that every 6.7 grams of shot were equal to 1 cc. of water. This method of determining the capacity of each sinus renders it an easy matter to make comparisons. Note also the very considerable antero-posterior diameter in specimen No. 24,—three quarters of an inch, and the large ostia. The sphenoidal sinus in this specimen is above the average, with large openings into the superior meatus.

In specimen No. 20 there is a small sinus on the right side and in No. 21 it is only present on the left. No. 25 shows an average sinus with an almost symmetrical septum, No. 26 a well marked horizontal partition as well as a vertical one. No. 27, a fragment, shows an average thin-walled sinus on cross section and the manner in which this air space blends with the ethmoid labyrinth. No. 28 shows a small sinus behind very decided supra-orbital ridges. The ostium on the right is large and patulous while on the left the ostium opens into an anterior ethmoid cell. Specimens No. 29 and 30 show average sinuses behind comparatively smooth foreheads. Thus examples might be multiplied. Almost all of them are asymmetrical.

H. Lambert Lack[5] says that the average depth, behind the supra-orbital margin, is from 4 to 8 mm. This writer quotes Lothrop as finding both sinuses invariably present in the orbital region after an examination of 250 specimens, but in three per cent the vertical portion was absent. "Logan Turner, in 240 European skulls, found one or both sinuses absent in forty-one; that is in 17 per cent. Among these in 7.5 per cent both sinuses were absent and in 9.5 per cent one sinus was absent. Tilley found entire absence of the sinuses twice in 120 skulls, in one case in association with prominent brows. Kicer found both sinuses absent five times and one sinus absent seven times in 195 skulls. Max Scheier found no frontal sinus twice in 100 skulls. On the whole, the sinuses seem to be larger in males than in females and are smaller and more often absent in races with receding foreheads; but the size of the cavity bears no constant relation to the prominence of the supra-orbital ridge. Developmentally, the frontal sinuses are absent at birth and up till about the sixth year. They apparently begin to develop as a protrusion from the ethmoidal region at about the sixth or seventh year and slowly spreading between the tables of the frontal bone attain their full size and dimensions at or about the age of puberty."

Writer:	Skulls examined.	Sinus absent on both sides.	Sinus absent on one side.	Sinus absent on right.	Sinus absent on left side.
Lothrop	250	0	†	----	----
Logan Turner	240*	18	23	9	14
Tilley	120	2	----	----	----
Kicer	195	5	7	----	----
Max Scheier	100	2	----	----	----
Tunis	100	1	3	1	2
	1005	28	33	10	16

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1. Holden: Human Osteology, Seventh Ed., London, page 50.

2. Logan Turner: Accessory Sinuses of the Nose, Edinburgh, 1901.

3. M. H. Cryer: Jour. Amer. Med. Assoc., Vol. XLVIII, pp. 284-289, Jan. 26, 1907.

4. A. Onodi: Die Nebenhöhlen der Nase, Wien, 1905, Tafel 113, Fig. 113.

5. H. Lambert Lack: The diseases of the nose and its accessory sinuses, London, 1906, pages 15 to 17.

No. 1426 Pine Street.

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*European Crania. †Vertical portion absent in 3 per cent.

A Case of Malignant Tumor of the Thyroid Gland. H. C. Kloepper. *Medical Fortnightly*, September 10, 1908.

This case of malignant growth in the thyroid, a rare occurrence, was presented to the Medical Society of the City Hospital Alumni of St. Louis. The tumor before operation was diagnosed as malignant adenoma, but examination after death threw some doubt upon this.

In the latter part of her illness the patient, a woman of 71, had severe cough and dyspnea, but no pain. Physical examination showed considerable exophthalmos and a cyanotic color of lips, face and hands. The entire body was covered with a profuse, clammy, cold perspiration. There was edema and swelling of both legs above and about the ankles. No operation was attempted. Eaton.

NOTES UPON TWO UNUSUAL FRONTAL SINUS CASES.*

BY J. PRICE BROWN, M. D., TORONTO, CANADA.

Case I.—Chronic Purulent Frontal Sinusitis with External Fistula for Nearly Two Years—Operation—Recovery.

February 28, 1907, Miss M. F. was referred by Dr. Black, of Paisley, for treatment.

History—In Septmber, 1904, two and a half years previously, while attending college in Toronto, she had an attack of fever; resulting in frontal abscess on the right side. This was lanced by the attending physician in consultation. There was a free discharge of very foul pus. Under treatment, healing took place in a month, and she went home to Paisley. Toward Christmas swelling of the forehead returned, and Dr. Black reopened it. From that time until the following March discharge was almost constant, and she was brought to the city again for further advice. The consultants decided that it was a case of frontal sinus disease, requiring immediate operation. Consequently, under general anesthesia, it was opened through the floor, the excision extending up into the superciliary ridge. An opening was also made downward through the region of the fronto-nasal passage into the nose, and an attempt was made to secure nasal drainage. The result was not satisfactory. The fronto-nasal passage closed and the external opening refused to heal. The discharge would sometimes almost cease and again for days come away more freely. Four months later the sinus was still open. Then, to secure more efficient drainage and lavage, the doctor inserted into the opening a short rubber tube, through which the cavity was washed out regularly. It was worn for nearly a year and then discarded. Subsequent to this the patient would sometimes probe the cavity to obtain a better outlet to the pus, or the doctor would make the passage free with the lance. Finally, after having almost continuous discharge for two years, a sudden aggravation of all the symptoms occurred and the patient was referred to me.

Examination.—Left eye almost closed, the eyelid swollen and inflamed, the swelling extending upward over the superciliary ridge and including the inner canthus. The surface beneath the ridge was irregular, pultaceous and darkly suffused in color, with pus exuding from a point immediately over the site of the sinus operation. There was a good deal of pain over the region, accompanied by headache. An X-ray picture, the one shown to-day, did not reveal much, save a darkened shadow on the affected side, and the opening in the bony wall from the previous operation upon the sinus. There was no shadow in the maxillary region.

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*Read at the annual meeting of the American Laryngological Association, Montreal, June, 1908.

Intranasally there was little if any pus visible, but the middle turbinal and a portion of the inferior turbinal were removed. This had to be done under general anesthesia, as the young lady was too nervous to submit to any operative work under local anesthesia.

How to operate upon the sinus was the next question. I was unwilling to attempt a radical operation after Coakley's plan for cosmetic reasons. Killian had not yet visited the country, and at that time I knew little of his operation. At the same time, I was strongly impressed with Fletcher Ingal's intranasal treatment and use of gold tubes. As in his cases, the desideratum of nasal drainage was secured, something which Killian now insists upon as essential; the thought struck me that a gold tube inserted from the frontal sinus downward through an enlarged fronto-nasal passage might be equally effectual. The external wound could then be closed, irrigation would be obtained through the tube, and the latter eventually removed through the nose. So an operation was done under general anesthesia. The eyebrow was not shaved. The incision was made through the centre of the eyebrow from the middle inward to the median line. The periosteum was then raised directly upward over the inner end of the sinus, and a rectangular piece of the outer table chiselled out above the superciliary ridge, the long direction being upward. The object was, while leaving a minimum of deformity, to permit a straight drill to be passed downward and backward to destroy the anterior ethmoid cells, the incision and the removal of the bony wall being entirely distinct from the site of the former surgeon's operation.

A quantity of pus and blood welled out on opening the sinus, the cavity was curetted and freely irrigated. Then, the infundibular point being found, successive hand drills were used until this larger one could be inserted and a free entrance made into the nose, external to the septum and in the region of the anterior end of the middle turbinal, A curved forceps was then passed downward through the passage and after repeated irrigations the gold tube was inserted from above.

The external wound was at once closed. It healed in a very few days by first intention, but to my chagrin I found it impossible to irrigate the sinus through the tube as intended. The girl had passed through so many operations that she became hysterical the moment an attempt was made to pass any instrument, even the end of a syringe, into the nasal passage. Another point, while the discharge from the old fistula, which I had not disturbed at all, materially lessened, it did not cease, while it still continued to be inflamed and tender.

Hence, twenty-three days after the insertion of the gold tube. I operated again. This time I made a similar incision to the former one, parallel to it, but below the eyebrow, and directly through the central point of discharge. From the opening two or three bits of dead bone were taken. The outer tissues were then raised over the entire extent of the original operation, the gold tube was removed from above and a large rubber tube inserted in its place; the upper end being curved on itself, to lie on the floor of the sinus, and the lower end extending beyond the nostril. The outer incision was then closed as before.

This time the result was all that could be desired. Although the tissues through which the incision had been made were inflamed, darkly suffused and spongy, the healing was again by first intention.

The sinus was for a time irrigated regularly twice a day with warm sterilized water. The discharge gradually diminished and in a few weeks it practically ceased, when the tube was removed.

From then until now there has been no return of the disease and the patient is quite well. This I think is due to the fact that the wearing of the gold tube for twenty-three days secured permanent and effectual drainage from the affected cavity.

This photograph, taken last month, one year after the operation, indicates how small a deformity has resulted from the operation.

Case II. Traumatic Frontal Sinus Disease—Operation—Recovery.

History—In April, 1907, Mr. J. F., age 35 years, married, received a severe blow from the head of a horse; the region struck was that of the right temple at the outer end of the frontal sinus. After some weeks this was followed by a swelling beneath the right eye-brow and tenderness on pressure. Later on both these symptoms subsided. In the following August, also, he had the misfortune to strike his forehead against a stone wall, resulting in an abscess which was lanced. In due time this healed, leaving a surface depression.

Early in January, however, his head began to be sore, followed by pains in the region of the frontal sinus, shooting backward toward the occiput. This was accompanied by the sensation of fullness and pressure in the forehead on that side, the condition being always aggravated at night time. Toward the end of January swelling beneath the right eyebrow also returned, with marked tenderness on pressure over the central portion of the sinus, while sleep at night became almost impossible. During this period the patient was under Dr. Wilson's care; but medical treatment failing to afford relief, on February 22nd he referred him to me and he was placed in the Western Hospital for operation.

Examination.—Head feels hot continually, temperature ranges between 99 and 100, soils two or three handkerchiefs a day from right nasal hemorrhage, complains of intolerable bursting head pains and entire absence of sleep. There is also drooping of tissues beneath the floor of the sinus and much tenderness on pressure.

The right side of the septum was much thickened and spongy, the anterior end of the middle turbinal also was enlarged. Both were hemorrhagic, but there was very little pus visible.

My first effort was to give relief by intranasal treatment; so, under cocaine and adrenalin, I reduced, by operation, the hypertrophied tissues, but failed either to penetrate the infundibulum or give relief to the frontal sinus.

So, five days later, under chloroform anesthesia, assisted by Dr. Wilson, I did a modified Ogston-Luc operation; that is, after chiseling the usual opening into the frontal sinus above the supercilary ridge, instead of merely dilating the fronto-nasal passage and putting in a small drainage tube, I drilled a larger opening, destroying the anterior ethmoid cells; and placed a rubber drainage tube from the floor of the frontal sinus down through the nasal passage and out through the nostril.

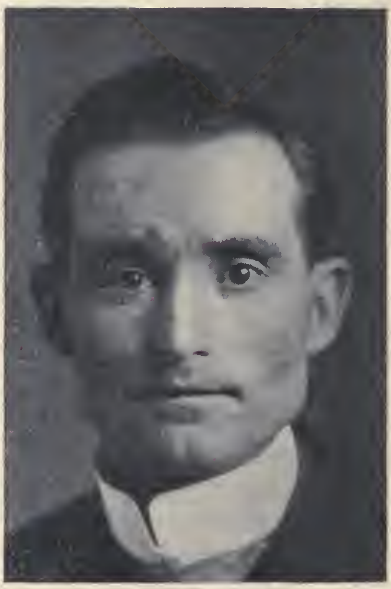
On opening the sinus there was very free hemorrhage, accompanied by purulent matter. The blood vessels were enlarged. The mucus membrane, particularly on the anterior wall, was swollen and spongy, that on the cerebral side of the cavity being little affected. After curetting away freely all adventitious tissue, the sinus was washed out with hot boracic acid solution, then swabbed with peroixde of hydrogen, and the operation completed. The drainage tube was next inserted and lavage repeated both from above and below. Finally the wound was closed by silk sutures and padded and bound.

A swab was taken from the sinus at the time of operation. Examination revealed pus cells mixed with blood. Another swab taken ten days later from the sinus, quite free from blood, proved the disease to be one of pure pneumococcus infection.

Points with regard to temperature. Immediately before the operation the temperature was 99 1-5; three hours later it was 101 1-5, and still two hours later, at eight o'clock in the evening, it had risen to 104½ and was accompanied by delirium. Throughout the night the patient could with difficulty be kept in bed. In the morning the temperature dropped to 101 1-5, the delirium was over and did not again appear. Still the second night the temperature rose to 103 4-5, subsequent to which time it was almost invariably normal.

The respiration throughout was above normal, always between 20 and 25 per minute. At the time of operation it was 24 per minute. The pulse also from the first was rapid, running from 100 to 120 per minute.

Possibly the rapid pulse and respiration might be due to a general pneumococcic infection with local focus within the frontal sinus. With regard to after treatment, the intention was to wash out the sinus, regularly, through the wide drainage tube, by means of a small-tipped instrument. This was carried on effectually for some days; but possibly due to the high temperature of the first forty hours, the wound did not heal by first intention. The stitches loosened and were removed and the whole wound opened.



Granulation commenced and the lavage was then done through the nose from above; sixteen days after the operation the tube was removed through the nose, and as the sinus wound was closing a small rubber tube was placed at its inner end and the lavage continued. Latterly, no other treatment was followed, save to cover over the small opening of the wound and tube with adhesive plaster, to be replaced after each irrigation. The boracic solution came through the nostril freely and was soon free from pus. By April 16 the discharge from the sinus had ceased, so the little tube was removed, irrigation dispensed with, and the wound allowed to close—the patient being warned against all nose blowing until entire healing had taken place.

One point is worthy of note as brought out in this case, that is the advantage of a reversed Valsalva in cleansing the fronto-nasal passage during the process of healing. While the little tube was in situ in the forehead, although there was no external discharge whatever, the air would whistle through the passage with each forcible effort to draw backwards; and with the effort, any mucus lodged within the passage would be removed. When the little tube was finally taken out the Valsalva drawing backward was forbidden, in order to favor surface healing. The present condition of the patient with a healed sinus is well marked in this photograph, which was taken only a few days ago.

In closing, I might make one other remark, which applies to both of these cases. Although the anterior ethmoid cells were engorged and the middle turbinal pressed tightly against the septum, yet in neither case was there any indication whatever of the antrum of Highmore being affected.

37 Carlton Street.

Oedematous Nodules of the Vocal Cords. L. RETHI. *Monatsschr. f. Ohrenheilkunde*, September 1905.

The author reports a case of a singer who had a spindle-shape swelling on the anterior half of the vocal cord, which disappeared when the organ was placed at rest, but appeared again as soon as an attempt was made to use the voice. This condition persisted even after the swollen mucous membrane was removed. Believing that he had to deal with a chronic oedematous swelling of the ligamentous structures of the cord, the author made four deep incisions into the cord, parallel with the free border. This procedure resulted in a complete cure of the case.

In a second similar case in which there was in addition to the swelling a nodule, situated upon the center of the swelling, he removed the nodule and then made similar incisions into the cord. The result was equally satisfactory.

YANKAUER.

THE RELATION OF PATHOLOGICAL CHANGES IN THE ACCESSORY NASAL CAVITIES TO DISEASES OF THE EYE.*

BY CHRISTIAN R. HOLMES, M. D., CINCINNATI.

This subject has become so extensive that in a paper like this, one must confine himself to a brief resumé of the most important facts. Although the anatomy of the nasal accessory sinuses of man has been well known for about thirty years, thanks to the indefatigable work of Zuckerkandl and others, and the comparative anatomy of these cavities has been worked out for some of the higher animals, their functional uses are still a subject of speculation for the physiologists who have evolved some most ingenious and interesting theories as to their various functions and reason for their existence. But a knowledge of the diseases of this part of the upper air tract is a matter only of the pathological yesterday.

This latter accomplishment is due to the rhinologists, whose daily contact with the nose and throat gradually impressed upon them the dangerous character of the inflammations of which they are frequently the seat.

Cases such as are now familiar to all of you, as lately as ten years ago were deemed to be in the province of the physician, the ophthalmologist or the dentist, and it was only when the rhinologist, with his special knowledge of the anatomy of the head and neck and his abundant clinical experience of the diseases of this region, began a systematic study of the accessory cavities for the purpose of working out a safe and intelligent surgical anatomy, that it was possible to present to the scientific world a complete exposition of the etiology, symptomatology, pathological anatomy. bacteriology and operative treatment of the diseases of the accessory sinuses of the nose. Their location, shape, structure and relation to important adjacent or surrounding structures, makes treatment or surgical interference often both difficult and dangerous. Their walls are frequently only of paper thickness, and in direct contact with vital structures. Under such conditions we are frequently unable to remove all necrosed bone. Take, for example. the sphenoid cavity; its walls are always thin, and at times dehiscent in the region of the optic nerve and cavernous sinus—we now know from postmortem reports that the walls are often necrotic—

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*Presented at the 14th annual meeting of the American Laryngological, Rhinological and Otological Society, held at Pittsburg, May 28-30, 1908.

and while you may make a free opening in, or even remove all of the anterior wall, you cannot possibly, with safety, remove the other necrotic walls of this sinus—but must trust to the natural process of exfoliation and repair. Sometimes we have in any or all of these cavities septa and diverticula or irregularly projecting cells, that it is almost impossible to reach, unless the most radical operation is resorted to; and even then, the field is not always clear, especially in the region of the sphenoid. The natural openings into the cavities are so located, that in disease, drainage is greatly interfered with; and especially is this true in the case of the antrum of Highmore and sphenoid, where they are near the roof instead of the floor. The outlets from the other cavities are more favorably placed, but polypi or hypertrophied turbinals can most effectually close them off.

The manner in which infection enters these cavities in the vast majority of cases is through the natural openings when the patient is suffering from an acute or chronic infection of the Schneiderian membrane.

Dr. Robert Falcone recently tested the correctness of the theory of Harke and Hajeck, and proved that infected material may be forced into the sinuses during violent sneezing or blowing of the nose. These experiments were made on dogs; whether they will hold good to the same extent in man it is difficult to tell, but we do know that during the act of vomiting, some of the contents of the stomach have been forced into the accessory sinuses.

Infection, no doubt, sometimes extends from the nares to the sinuses through the blood and lymph vessels of the contiguously inflamed tissue,—swelling of the mucous membrane in the nose may occlude the natural openings which is soon followed by an absorption of the contained air, creating a vacuum. This leads to transudation of serous fluid into the cavity as we find it in the middle ear. This fluid forms a favorable medium for the development of pathogenic bacteria should any be present or gain entrance later. Carious teeth play a somewhat important role in the development of antral suppuration. While the dentists and many rhinologists formerly attributed nearly all cases of antral infection to dental disease, it is now generally accepted that from five to ten per cent is more nearly correct. From the specimens that I have examined, I feel convinced that the percentage must be small.

It must not be forgotten that the cavities having no connection with the teeth are just as liable, if not more so, to be infected, than is the antrum of Highmore.

Harke, in 37 postmortem examinations of children dying of diphtheria, whooping cough, scarlet fever, measles and chicken-pox, in every case found suppuration in one or more of the accessory cavities, the maxillary antrum being the most frequently affected. While children are frequently attacked, fewer cases come to operation than among adults, because, usually, their recuperative powers are greater than those of adults. The most frequent cause is undoubtedly influenza.

Dr. Darling, Pathologist to the Ancon Hospital, Isthmus of Panama, conducted an investigation to determine the relation of inflammations of the accessory nasal sinuses to pneumococcus infections. The sinuses were examined with regard to this point in 52 autopsies, 37 of which were pneumococcus infections, as follows: Lobar pneumonia, 22; acute pericarditis, 1; acute meningitis, 9; pneumococcus septicemia, 5. He found that 92 per cent of all pneumococcus infections coming to autopsy showed in a very marked degree more or less typical pneumococcus inflammation of one or more of the nasal accessory sinuses. The inflammation was generally intense. It was fibro-purulent in character. Pneumococci were always present, and in numbers dependent on the duration of the process. A point of great importance was that the age of the sinus infection had been appreciably greater than that of the lung of meningeal lesion. Ninety-one per cent of the lobar pneumonia cases showed a sinusitis. All cases of acute pneumococcus meningitis presented an inflammation of one or more of the sinuses, and in every one the middle ears and mastoid cells were normal. In the pneumococcus septicemia group 80 per cent were found to be associated with a sinusitis. In the case of acute pericarditis all the sinuses were involved. In fifteen autopsies of other than pneumococcus infections 28 per cent had an acute inflammation of the sinuses. Darling believes "that the portal entry of the pneumococcus is in most instances an accessory nasal sinus, the mucous membrane of which is probably fitted for the reception of the pneumococcus by an antecedent influenza or rhinitis."

Erysipelas has been regarded as a cause, but it can now be positively asserted that it is *secondary to sinus disease*. In a study of this subject which I undertook about a year ago, I found a vast mass of recorded cases, the details of which proved conclusively that attacks of facial erysipelas invariably arise from an infection due either to an increased virulence of the streptococci which inhabit the diseased nasal chambers, or to a reduction of the vital powers of the patient inviting an infection by these micro-organisms, or, more probably, a combination of these two active factors in disease. Tuberculosis may, by ulceration and necrosis, extend from the nares into any of the sinuses. I have seen but few such cases, and cannot help wondering if they are as frequent as some would have us suppose. On the other hand, syphilis is frequent, but, as a rule, I have found that it yields readily to vigorous internal treatment. Malignant tumors may invade or develop within the cavities. It is needless to state that an early and correct diagnosis is of vital importance. If the disease is at all extensive, the prognosis is always very grave. It is remarkable to what an extent these growths may cause displacement of the contents of the orbit without interfering with vision, or even causing diplopia. This is, of course, explained by the absence of inflammation, and the slowness of the growth which enables the parts to adjust themselves to existing conditions. Individually I have come to the conclusion not to use the knife hereafter on malignant tumors in this region—it is so hopeless. I know of only one method that gives any hope at all, and I intend to use it in all future cases wherever possible. I refer to the cataphoric treatment of malignant growths by the Belton Massey method. Either use his hollow gold electrodes filled with metallic mercury, or the zinc electrode, amalgamated at the moment of using with sulphuric acid and mercury, is the proper method. By using from 400 to 1,000 milliamperes of current under a pressure of from 50 to 75 volts, most remarkable results can be obtained. Massey's explanation of the action of this cataphoric sterilization is as follows: "By the electrical conversion of metallic mercury injected into the growth into a soluble oxychloride, which is then diffused in all directions through the growth, the protoplasm of the cells, germs and all, is converted into an albuminate of mercury, rendering the dead mass thus formed aseptic and odorless until it drops off, leaving a clean wound to be healed by granulations. But the method does not stop its usefulness at the edges of the slough thus formed. This area of destruction, which should be coterminous with the supposed edges of the growth, is surrounded by a sterilized zone of varying extent, within which the diminishing density of the radiated chemical leads to the death of the lowly organized cancer cells only, the normal tissues being merely stimulated to a greater physiological resistance."

I used it successfully seven years ago in a case of sarcoma involving the tonsil and base of the tongue, and not as yet reported. Recently I have used it again in a case of sarcoma of the hard and soft palate the size of half a small orange, under general anesthetic of about one hour's duration, leaving the whole tumor a grayish white, shrunken, coagulated mass. This method is, of course, not applicable in a cavity enclosed by bone until you have surgically exposed the growth.

Non-malignant growths, such as fibromas, generally originate in the fibrous tissues beneath the mucous membranes of the naso-pharynx, and invade the sinuses or cranial cavity secondarily after the bony walls have been absorbed by pressure. They frequently set up a purulent sinusitis, a condition that adds to the danger of their removal. Such a case I reported last year in the Ohio Medical Journal. The growth was a dense fibroma arising from the fibrous tissues on the anterior surface of the sphenoid, and had eroded the bony structures in its neighborhood until it had invaded both frontal sinuses, the ethmoid labyrinth, the right maxillary antrum, and the anterior cerebral fossa.

A purulent ostitis—for it was impossible to localize the process by an anatomical regional name, it was so diffused—complicated the case and made it one of that dangerous class to which I have referred, and a fatal ending followed five days after the operative reremoval of the growth.

The membranous lining of the sinuses may be regarded as a modified continuation of the Schneiderian membrane, Lothrop states that the mucous membrane which lines the frontal sinus "does not differ in essential characteristics from that found in the other accessory nasal cavities. In general, it is somewhat thinner than that found in the antrum of Highmore, and more easily detached from the bony wall of the sinus. In section it presents the following layers: Facing the cavity of the sinus is a layer of ciliated columnar epithelium between the cells of which are interspersed a variable number of goblet cells. The cilia produce a current toward the ostium frontale. Underneath the epithelium is a layer of loose connective tissue cells between the meshes of which are glands and round cells. This layer is capable of enormous increase in thickness, in consequence of inflammatory processes, by the addition of the serous element and leucocytes from the blood. The cavity of small sinuses may thereby be obliterated, and the consequent pressure gives rise to excruciating pain. The lining of the frontal sinus contains fewer glands than that of the antrum, and their distribution over the surface is unequal. Underneath this loose layer we come to a rather dense basement layer, composed of compact fibrous connective tissue cells. This is next to the bone and serves as a periosteum. It is easily detached, except in the vicinity of the ostium frontale, where it is continuous, directly or indirectly, as the case may be, with the mucous membrane of the nasal cavity. Delicate vessels passing between the membrane and the sinus wall, help retain these structures in approximation."

Twenty years ago dacryocystitis was a very common affection, and many of us can remember seeing in clinic and private offices patients sitting about with silver probes projecting from their nasal ducts. I venture to say that you saw 20 of them to one that you see now. The oculists of those days were treating the symptoms instead of the disease, and continued to do so until the rhinologists discovered that tear sac affections are nearly always due to an inflammation having its primary seat in the nose. Treatment at the lower end of the canal, instead of probing from above will, as a rule, bring quick relief in acute cases. An undiscovered purulent inflammation of the antrum may extend to the tear sac, causing purulent dacryocystitis, for which the patient seeks the advice of an oculist,—I have described such a case in Hansel & Sweet's "Diseases of the Eye." In that case I found that we had to deal with a perisacular abscess—and every accessory cavity on that side was in a state of chronic empyema—all cured by a radical operation. Cysts may spring from any cavity. The frontal sinus is, perhaps, most frequently affected. The most typical case I ever encountered is also figured in the text book quoted above. It occurred in a woman about 55 years of age. The swelling appeared long before she sought advice. The globe was enormously displaced downwards and outwards—movements of the eye were almost entirely abolished. The cornea was exposed, requiring a pad and bandage over the lids for its protection, yet vision was practically normal and ophthalmoscopic examination negative, except for a slight dilatation of the veins,—operation revealed that the cyst had eroded all the anterior portion of the os planum and the anterior ethmoid cells, the floor of the frontal and most of the dividing septum between the two frontal sinuses. The contents were of a greenish brown color, and sticky, oily consistency. Analysis and bacteriological examination showing it to be mucous and free from organisms. These cysts are always of slow development, are firm, elastic or semi-fluctuating on pressure at the center, but have a firm bony or ring-like feeling at the base. Epiphora, and in some cases, diplopia, are the only symptoms in this class of cases. The nasal examination is generally negative. The etiology of mucocele is nearly always a previous catarrh, with closure of the ostium and accumulation of mucus, the external swelling not developing till months or years after the primary catarrhal attack. Turner states "that the ostium is generally closed during the formation of the mucocele, but at the time of operation may be found open. In the latter case the contents of the cyst do not escape because they are too thick."

Osteomata are rare; they may develop in any of the cavities, or within the nose. They are usually pedunculated and of ivory hardness. They may extend into the orbit causing displacement of the globe with epiphora.

I recently removed one the size and shape of a hickory nut,—it sprang from the upper portion of the antrum of Highmore, growing into and obstructing the left naris and causing epiphora. It was removed through an extensive infra-orbital incision—a scar in this region indicating where a similar growth had been removed 18 years before—so that we may possibly regard this as a recurrent growth.

In considering the purely inflammatory conditions, we must divide them into two groups—acute and chronic, bearing in mind that the chronic varieties are liable to acute exacerbations, the pathogenic organisms becoming *for the time being very virulent.* Especially must we fear the streptococcus. It is during such periods of *increased virulence* that it behooves us to think twice before operating lest our case develop erysipelas (auto-infection) or the infection lead to venous thrombosis, meningitis, or brain abscess.

One of the most serious but infrequent results of a sinus infection is an infective thrombosis of the cavernous sinus with involvement of the contents of the orbit. One can readily see how infection or thrombosis may extend from the ethmoid vein into the ophthalmic vein and cavernous sinus, or by direct extension through the thin or dehiscent walls of the sphenoid cavity, just as we can trace the disease from the mastoid cells to the thrombosed lateral sinus.

An important point that I wish to emphasize is this—in purulent frontal, ethmoid or sphenoid cases (i. e. the cavities close to the brain) we should avoid making any minor intranasal operation shortly before the radical operation is undertaken, because even a slight operative attack in an infected nose may cause an increased virulence of bacteria. Killian says "the most difficult thing is to estimate the virulence of the bacteria." In one acute case we may operate boldly with favorable results, while in another with apparently identically the same set of conditions, so far as we are able to tell by any and all means at our command, infection develops, and the case goes on to a fatal termination. We should therefore make it a rule, where possible, to operate as the general surgeons do for appendicitis; i. e., *after* the acute symptoms have subsided, or, if it should become absolutely necessary, make only a sufficiently large opening to drain the cavity *for the time being.* We should, of course, always be specially careful when in the region of the cribiform plate—or the exposed dura—where the inner table is necrosed. Here we often find ragged, unhealthy looking adhesions formed around the opening. This is the "phagocytic wall," nature's great barrier against meningitis, *and one we must not disturb!* The violation of this rule by the over radical operator, I believe, has cost many lives.

If we note how the veins from these infected sinuses, as, for example, the ethmoids and frontal, drain into the ophthalmic vein and cavernous sinus, or even pass through the bones in contact with the membranes of the brain, or enter the brain itself—we must marvel that there are not more fatal cases.

The light that has been thrown upon the etiology of many affections of the eye and its appendages, has resulted from the joint work of the ophthalmologists and rhinologists. It is not so many years since all headaches and eye pains that did not yield to the treatment of the family physician were sent to the oculist for glasses—and, for a time, the claims of the refractionist ran riot—according to some there was nothing that properly fitted lenses and prisms would not cure, from insanity to hemorrhoids. Many were cured because they *did* need glasses—others temporarily helped by "suggestion"—but a large percentage were not helped because the seat of the trouble was in the nose and sinuses, and not in the eye. We now know that the majority of these cases can be cured or relieved by proper treatment of the upper air tract—but here again we must not let our enthusiasm claim everything, for although in some cases the symptoms may be referred to the head, the cause may be located in a distant part of the body, as was well illustrated in one of my patients, a woman of 38 years, well developed and nourished, who was under my treatment for progressive catarrhal deafness and tinnitus, with naso-pharyngeal catarrh—no sinus involvement could be demonstrated. While in my hospital she developed a violent attack of glaucoma, complicated with plastic iritis coming on the day her menstrual period began. From the history now elicited, I learned that she had during the past 18 months suffered pain and redness of the same eye at every menstrual period, which discomfort, however, generally subsided with the cessation of the flow. This was the first violent attack. A gynecological examination revealed the need of a curettment of the uterus, which was performed, and the eye became normal; and although several years have elapsed, she has never had the slightest irritation of the eye, which quickly regained perfect vision.

We have now many cases on record where partial or total blindness of one or both eyes with violent pains, has been promptly relieved by recognizing the presence of an empyema in one or more of the cavities, and instituting the proper treatment. In this class of cases it is nearly always the sphenoid cavity that is at fault, because of its intimate relation to the nerves, arteries, veins and muscles of the eye. The eye seldom causes any trouble with the nose and sinuses, but the latter very often involves the eye and orbit. It is important, therefore, that all ophthalmologists should know more about this subject in order to be able to recognize cause and effect.

St. Clair Thomson says that "many cases present themselves in the first instance to the ophthalmologist, so much do the eye symptoms induced overshadow all others."

In this class of cases we find as leading symptoms, pain, steady or intermittent, contraction of the field of vision, general asthenopic symptoms, hazy vision, tenderness of ocular muscles, inflammation of the conjunctiva and uveal tract, optic neuritis and atrophy; but this part of the subject I shall leave to one who, by his keen observations and facile pen has rendered most valuable service to our specialties—I refer to Dr. Posey, who honors me by opening the discussion on this paper.

The symptoms are indicated in the accompanying table:

SYMPTOMS.	ANTRUM OF HIGHMORE.	FRONTAL SINUS.	SPHENOID CAVITY.	ETHMOID CELLS.
Pain.	In teeth; in upper jaw and nose; sometimes only in frontal region. May radiate over whole side of head.	Supra-orbital—weight and oppression above and behind the eye.	Frequently occipital—sometimes excruciating back of the eyes. Considered by some as the most characteristic. Sometimes in vertex, or in temples. Frontal. Deeply seated in ear (In 9 cases out of 42 cases with autopsy). (Mastoid opened in 3 cases and sigmoid sinus in 2 cases). Sometimes referred to other sinuses. Pain on opposite side.	Frontal—bridge of nose.
Tenderness.	Over the canine fossa and exit of the infra-orbital nerve.	Over the frontal region—supra-orbital notch and above the inner canthus.	Some observers have found none—but, taking all the literature together, tenderness over the eye is frequent.	Above the inner canthus.
Discharge.	Can be seen covering the inferior turbinal and floor of the nose.	Can sometimes be seen coming down from the infundibulum.	Sometimes none visible to good observers. Sometimes thick pus on cavum pharyngeum. Sometimes far back in middle meatus.	Can be seen at various points in the vault,—location depending upon whether anterior or posterior cells, or both, are involved.
Swelling.	Sometimes quite marked over whole upper jaw. Sometimes completely absent.	Not infrequent above the inner canthus and root of nose—sometimes due to external periostitis.	None external over face. Internal swelling of structures from middle turbinal up on affected side. St. C. T.'s case. Swollen purulent glands under sterno-cleido mastoid on affected side. Oedema of lids with thrombosis cav. sin.	None external—unless pus threatens to invade or invades orbit through plate of ethmoid—not infrequent in infancy.
Signs or symptoms on part of eyes.	Sometimes only congestion of conjunctiva. Lachrymation. Photophobia. Rarely orbital abscess.	Occasionally direct extension to orbit and formation of orbital abscess Corneal abscess (Fish) Erysipelas appearing about the orbit. Ocular symptoms occurring during influenza are suggestive. Glaucoma?	Pressure symptoms upon one or all of motor and sensory nerves and on vessels of orbit and globe. Papillitis or atrophy. When meningitis supervenes, unequal pupils, hazy discs, strabismus, etc. When cavernous thrombosis appears, proptosis and chemosis. Eyelids tense, discolored, edematous. Orbital abscess.	Orbital abscess not infrequent—sometimes it is the occasion for case being brought to surgeon. Erysipelas appearing about the orbit. Ocular symptoms in influenza are suggestive. Glaucoma.
Reflex signs.			Infrequently retraction of muscles of back of neck; twitching of muscles of upper extremity. (Meningeal or cerebral irritation). Author's case.	Asthmatic attacks in rare cases.
Transillumination.	Illumination of pupil abolished except where excess of polypi has expelled pus. Opacity of cheek except as above. Absence of subjective light sensation in eye of affected side.	Results uncertain. Sinus sometimes very small or absent, which may give misleading dark shadow.		
Fever.	Usually moderate or absent.	Usually moderate unless acute retention of pus occurs.	Slight or none. When cerebral complications begin to supervene, temperature may range as high as 105 degrees F.	Usually moderate unless meningeal or orbital complications arise.

Arteries and Veins.

NOSE.

Arterial Supply—Upper nasal region, anterior to the ethmoid cells, by the *ethmoid arteries.*

Artery of the Septum, a branch of the Spheno-palatine. Anastomoses anteriorly with the Descending Palatine from the Spheno-maxillary portion of the Internal Maxillary.

Posterior nasal branch of the Nasal or Spheno-palatine supplies the mucous membrane of the lateral wall of the nose.

Lateralis nasi from the Facial Artery supplies the ala and dorsum of the nose and anastomoses with its fellow of the opposite side, the nasal branch of the ophthalmic, the artery of the septum and the infra-orbital.

Nasal—the distal termination of the Ophthalmic—on the face—supplies the superficial structures of the nose and the lachrymal sac, and anastomoses with the angular from the facial and the vessels of the opposite side.

Infra-orbital supplies the lachrymal sac—anastomoses with the facial and ophthalmic.

NOSE.

Veins—1—*Plexus nasalis externus*—passing forwards to the external nares.
2—*Venae ethmoidales anteriores et posteriores* passing upwards into the cranial cavity and the orbit.
3—*A group passing backwards* to the soft palate and the pharynx.
4—*A group passing backwards and upwards* through the spheno-palatine foramen.
5—*A group passing through the cribriform plate* into the cranial cavity and anastomosing with the veins of the Pia Mater.

In addition to these five groups, *the plexus lacrymalis,* a most important set of vessels, penetrates the nasal and maxillary bones to empty into the nasal vein system on the face. This plexus establishes an additional, almost direct connection between the nasal cavities, the orbit and the structures of the face.

ETHMOID LABYRINTH.

Arterial Supply—*Ethmoidal arteries* anterior and posterior.
Posterior Nasal, a branch of the Nasal or Spheno-palatine from the Internal Maxillary.

Veins—*V. Ethmoidales Anteriores et Posteriores* pass upward toward the cranial cavity and the orbit, through the cribriform plate to the veins of the dura mater and the longitudinal sinus and to the veins of the orbital part of the frontal lobe of the brain, while others are deflected right and left through the anterior and posterior ethmoidal foramina to the ophthalmic vein which empties into the cavernous sinus.

FRONTAL SINUS.

Arterial Supply—*Ethmoidal Arteries* (anterior) from the Ophthalmic.

Branches from the *Spheno-palatine.*

Numerous minute *vessels from the bony walls* which help to bind the sinus wall and the lining membrane together.

Veins—Join the *V. Ethmoidales Anteriores et Posteriores.*

SPHENOID SINUS.

Arterial Supply—*Posterior Nasal*—branch of the Nasal or Spheno-Palatine from the Internal Maxillary.

Veins—Join the *V. Ethmoidales Ant. et Post.*

MAXILLARY ANTRUM.

Arterial Supply—*Alveolar* branch of the Internal Maxillary.

Infraorbital branch of Spheno-maxillary portion of Internal Maxillary.

Posterior Nasal, a branch of the Nasal or Spheno-palatine from the Internal Maxillary.

Veins—The major part of the blood is carried by a group of *nasal veins* (*Zuckerkandl's fourth group*) *which passes backward and upward* through the foramen spheno-palatinus into the canalis spheno-palatinus to join the maxillary veins on their way to the external jugular.

Nos. 8-10 East Eighth Street.

NEUROSES OF THE NOSE.*

BY CHARLES PREVOST GRAYSON, M. D., PHILADELPHIA.

I have the somewhat uncomfortable feeling that you will discover within the next few minutes that you have been made the victims of misplaced confidence on the part of your committee who did me the honor to invite me to present this paper. I shall make no attempt to be ponderously scientific, nor have I any intention of yielding to the temptation that this opportunity offers to add something new and startling to the already formidable list of reflex nerve disturbances for which the nose has been held responsible. On the contrary, I am very much of the opinion that before any further addition is made to this list, the foundation upon which it rests should be critically examined to see if it be secure enough to support even the strain to which it has already been subjected. I am conscious that there is in this statement at least a suggestion of doubt on my part as to whether the nose is really accountable for all those ills of reflex nature that have been attributed to it. I know that whenever it has been charged with any offense of this kind more or less evidence has been forthcoming to substantiate the charge, but, although I do not venture to say in the majority, yet in many cases at least this evidence has been of a purely circumstantial character and has seldom been sufficient to induce me as one of the large jury of rhinologists to concur in a verdict of "guilty." In almost if not all of them the "neurotic temperament" has formed a more or less conspicuous background to the various manifestations of nerve irritation, and the vagaries of this irresponsible temperament are unfortunately apt to be as misleading as they are notorious. In the *absence* of this powerful contributing factor, I should regard the prompt and permanent cure of an asthma, for instance, by the removal of a septal spur as forming a *prima facie* proof of nasal guilt, but whenever its presence can be demonstrated or even fairly suspected, the possible indirect and psychic effect of the operation would lead my conscience to decline any greater responsibility than would be involved in rendering against the nose the shifty Scotch verdict of "not proven." In the face, therefore, of the adverse criticism that I may perchance draw upon my head, I say without equivocation that to my mind whenever this troublesome temperament forms one of the premises in any proposition of a pathological nature, it vitiates and lays open to suspicion and dispute any positive conclusion that may be drawn. It is because of this embarrassing uncertainty that must always confront one in that class of nasal neuroses in which the nose is presumed to be the excitant of a reflex disturbance, that I find much greater satisfaction in dealing with that other class in which the nose itself is the site of the disturbance of innervation, that class in other words in which symptomatically the nose is the victim rather than the aggressor. The clinical features of these affections are so distinctive, so almost unique, that it is probably extremely seldom that we encounter any difficulty in the matter of diagnosis. How fortunate it would be, both for us and our patients, if our pathway to a complete understanding of the pathogenesis were as free from obstacles! I shall not occupy your time with any consideration of the functional derangements of the olfactory nerve. Ordinarily, these are of comparatively slight clinical interest and importance. It is rather to the vaso-motor neuroses as they are exemplified in the nose that I would venture to ask your attention, and I can clearly foresee the shudder with which you will suspect me of an intention to rake over the ashes of past discussions of hay fever. But this is not my principal purpose. My chief wish is to assist, simply as a mark of respect, at the obsequies of the latest "specific" for the treatment of that disease. I am not privileged to sit with the mourners, for almost from the moment of its birth I anticipated, predicted, and was prepared for its early death. And yet, I wish to lay a flower upon its grave because "pollantin" was conceived in a scientific spirit, the methods by which it was made were equally scientific and the reasoning that led to its production was, so far as it went, perfectly sound. But it went neither far enough nor deep enough. If it had, it is highly probable that no claim of specific virtue would have been made for the remedy. If the etiology of hay fever comprised no more than two factors—a predisposing idiosyncrasy and an atmospheric excitant—there would have been nothing illogical in the expectation that "pollantin" might take its place beside the antitoxin of diphtheria, but when we recognize the existence and fully appreciate the nature of the systemic condition that, it seems to me, is more or less clearly in evidence in every case of this disease, we will not be surprised at the percentage of cases that have been reported as but slightly improved or absolutely unimproved. For many years I have believed that a fundamental disturbance of the nutritive processes, of normal metabolism if you please, was responsible for the essential nervous element in the causation of hay fever. So long as we have a blood current contaminated with a number of toxic materials, the products presumably of sub-oxidation, so long are we almost certain to have nerve centres that are poorly nourished, over-sensitive to disturbing influences, and of reduced power to neutralize the effects of such influences. It seems to be, at least in hay fever, the vaso-motor centres that are earliest and most markedly affected, and when we have added to this not only the idosyncrasy, but possibly also a long precedent intra-nasal lesion that has helped to make the pituitary mucous membrane particularly intolerant of any form of irritant, we have but to await the floating of some variety of pollen or other obnoxious material within the nostrils to witness the speedy evolution of the symptom complex of this disease. If there is one fact connected with hay fever that, to my mind, throws a stronger light upon its remote causation than any other, it is that the affection is pre-eminently one of that class of people who lead the strenuous rather than the simple life. Why is it, may I ask, that these people have an almost exclusive monopoly of what we are pleased to term idiosyncrasies? Why is it that the laboring class is practically exempt from this species of affliction? Is it not because of the facts that its members go to bed with the chickens and rise with the lark, that they have their three frugal meals each day on the stroke of the clock, that, plain as it is, their supply of food is more often inadequate to even satisfy their appetites than to satiate them, that each day's labor involves wholesome muscle work that induces wholesome fatigue and brings dreamless sleep, and that, finally, their brains and nerves know nothing of emotional strain, of vaulting ambition, of crushing disappointment, or of sleep destroying passions of any kind? Is it not possible, think you, that if, instead of fulfilling her natural destiny, bare-footed, short-skirted, uncorseted Maud Muller had married the Judge, if she had flung aside her rake, had abandoned the cows that she had milked, the churn that had helped to make her broad of shoulder and deep of chest, and if she had substituted for these all the nerve shattering follies and vices of the modern society woman—Heaven forbid that I should attempt to enumerate them!—might there not have come a time and a condition, I ask you, when even the dim memory of raking hay would have sufficed to throw her into a paroxysm of sneezing? It may seem scarcely worth while to indulge in speculations concerning the nature of idiosyncrasies, but I have often thought that if we, as we all of us do, have certain conscious likes and dislikes, is it not possible that we have others, also, that are subconscious? Cannot our respective mucous membranes, for instance, owing to some individual peculiarity of structure or innervation, have certain antipathies of their own of which we may be wholly unconscious until lowered vitality, increased peripheral nerve irritability and lessened central control permit them to emerge from the obscurity of the back of the stage into the glare of the limelight at the front? I have fancied that we may either inherit or acquire in some way the seeds of these idiosyncrasies, but that they may lie fallow and inert until they are fertilized by and spring into life and offensive activity from a soil of poisoned and debilitated nerves.

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*Read at the 14th annual meeting of the American Laryngological, Rhinological and Otological Society, held at Pittsburg, May 28-30, 1908.

What a sublimely sanguine nature it must be, then, that still clings to the hope that a remedy of specific power may yet be discovered for hay fever! When a man so qualified by exceptional experience and unimpeachable judgment as Holbrook Curtis commits himself to the statement that "hay fever is a disorder amenable to no specific treatment," it seems to me that there is nothing left for the rest of us but to accept his opinion and to finally abandon that fatuous hope to which I have just alluded. And so, upon the tributary wreath that I cast upon the sod that covers "pollantin" I would write the inscription "Sic semper specifics." One more word relative to the treatment of this disease and I will take my leave of it. With no lack of respect for the profound laboratory studies that have dealt with the secretions of the hay fever sufferer, I fail to find in their results anything that is of genuinely practical value to us. It may be of some academic interest to know that the sweat contains an excess of something, that the tears that flow so abundantly during the attack contain too much or too little of something else, or that the saliva, perhaps, shows the presence of some material that is foreign to it, but of infinitely greater importance is it to remember and to remove the basic nutritive fault that is accountable for such alterations. This is a matter I think, to which the maxim "Immanente causa non cessabit effectus" is clearly applicable. Surely the drug treatment of hay fever, from a curative point of view, is utterly

[illegible]

to return to indolence and the flesh-pots, [illegible] would find me once more a refugee in so[illegible] or upon the rag-weedless bosom of the Atl[illegible] therefore, in which of the two places, the [illegible] nasium, a cure for this disease were the [illegible] you probably know what my answer wou[illegible] nut-shell, it is my belief that if a man tak[illegible] with *all* that this implies, his nerves and [illegible] take care of themselves.

Another nasal neurosis very closely allie[illegible] almost identical with it symptomatically, [illegible] rhoea spasmodica" or "paroxysmal sneezi[illegible] seems to be hay fever minus the latter's i[illegible] external irritants. The irritants of inte[illegible] doubt precisely the same in the two affec[illegible] the secondary nervous element is equally i[illegible] however, in rhinorrhoea spasmodica is mo[illegible] temperamental. **In other words, the** distu[illegible] equilibrium is the result in most of these [illegible] and transient stress of an emotional natu[illegible] may partially account for the absence of [illegible] nection with repeated attacks of this dist[illegible] of this statement, I may be permitted t[illegible] cases that I have seen within the past [illegible] whom could any evidence be found that would justify their being regarded as either hereditary or habitual neurotics, and none of whom had ever had a previous attack of this nature. The first was a man of middle age who was deeply involved in the stock market last Fall and who throughout the Winter was compelled, for want of margin, to let his holdings go one by one until, with the coming of Spring, he was as much a nervous as a financial bankrupt. The second, a woman who, during the several weeks of its closely preceding critical illness, could scarcely be dragged from the bedside of her child. And finally, a trained nurse of rather frail physique who, for an unbroken period of six weeks, had been vigilantly watching a patient possessed of a suicidal mania. The pathogenic fact that was common to these three cases was a prolonged and flagrant violation of those laws of personal hygiene relating to food, sleep and exercise, and the result, common also to all of them, was a most pronounced impairment of nutrition and of nervous vitality. Associated with the autotoxemia and nutritive failure were both unusual phosphatic waste and defective elimination. Although in each of them there was only such intranasal abnormality as would, under ordinary circumstances, have produced no discomfort, yet aided and abetted by the foregoing conditions it proved quite sufficient to induce indignant Nature to select the nose as the medium for her protest.

In conclusion, gentlemen, I am going to recall to your attention a third neurosis of the nose that has its origin in disorderly sexual functions. In the first place, we are all familiar with the fact that during the menstrual period not only is any coincident affection of the female nose apt to be aggravated, but even if it be normal it is often apt to reflect to some extent the ovarian excitement. It was perhaps his knowledge of this fact that led Doctor ——— to seek a cure for dysmenorrhoea through the cauterization of those areas in the nose that showed most plainly the secondary hyperemia and hyperesthesia. Shortly after the publication of his observations probably many of us through the kindness of our obstetric and gynecologic friends had opportunities for testing his conclusions, but I must confess that the results of my own series of cases developed little more than the opinion on my part that while in women functional derangement of the pelvic viscera was capable of producing more or less disturbance of the neurovascular mechanism of the nasal mucosa, yet that the control of this latter would have little or no appreciable effect upon the former. Always excepting, of course, the highly neurotic woman, and upon her there is scarcely anything in the fields of medicine, surgery, Christian science or osteopathy that may not produce the most extraordinary cures. In close connection with this, it is just barely possible that some few of you may have a dim recollection of a paper that I read at the semi-centennial meeting of the American Medical Association in 1897, concerning the influence of sexual excitement upon the intranasal circulation. The two cases that I then reported have since been followed by many others, and, could I conquer my aversion to hair-splitting distinctions in the sub-classification of disease types, I would venture to suggest to the author of the next text-book on diseases of the nose that he devote a section to "The Rhinitis of the Newly-Married," or, perhaps, "Honeymoon Rhinitis" would be shorter and more euphuistic. I have not introduced this subject in order to discuss its treatment, because as a consistent bachelor I could scarcely do otherwise than advocate preventive rather than curative measures, but I refer to it once more simply to express the opinion that the cause of this neurosis of the nose is as frequently overlooked or viewed with the same indulgent indifference to-day as it was ten years ago.

No. 251 South Sixteenth Street.

Acute Diseases of the Eye Following Acute Nasal Disease. E. BAUMGARTEN. *Monatsschrift f. Ohrenheilkunde*, May, 1906.

The author reports a number of cases in which one or more ocular symptoms, such as exophthalmos, swelling of the eye-lids, lacrymation, diplopia and paralysis, and neuralgia, were associated with acute accessory sinus disease, and were not relieved until the nasal condition was recognized and treated. This therapeutic result is regarded as proof of a causal relationship between these disease conditions.

YANKAUER.

The Bier Treatment of Middle-Ear Disease. L. FLEISCHMANN. *Monatsschrift f. Ohrenheilkunde*, May, 1906.

The author reports twenty-four cases of middle-ear suppuration, most of them acute, some with more or less pronounced mastoid symptoms, and a few chronic cases, treated, lege artis, with passive hyperemia. A perusal of the histories of these cases makes one far from enthusiastic over this plan of treatment, and the author, in summing up, says: "Passive hyperemia clouds the clinical picture, converts manifest into obscure conditions, and tempts us to delay which may prove fatal to the patient.

YANKAUER.

A NEW FLAP IN THE RADICAL OPERATION.*

BY GEORGE A. LELAND, M. D., BOSTON, MASS.

Some investigations I have been making for two or three years have resulted in the production of a flap for closing off the aditus from the mastoid cavity. Dr. Crockett has it down on the program as a new flap. I do not know whether it is a new flap or not, but I have not been able to find it in the literature. We have all probably had to go through the mastoid operation a second time. Then the patients kick, because they think it was not done properly the first time. I confess that the first secondary mastoid that I did I thought that the first operation had not been properly done; but after investigating a number, I concluded that it does not make so much difference how they are done first; whether they are properly cleaned out or not, they may be just as likely to need a secondary operation. These secondary operations come from a few weeks or months to a few years after the first. I have had occasion to operate during the last four or five weeks on four cases of secondary mastoid; some of the first operations I had done myself, some had been done by others. One recurred eleven years after the primary operation. In one of these cases I had operated on the child in infancy after scarlet fever. A year afterwards he was operated on for a secondary mastoid at the Carney, which was evidently done all right. Within the last two or three weeks I have had to operate again for a large amount of cholesteatoma which destroyed the whole cavity, and in that case the radical operation was done. The question arises, how can we stop the secondary infection of these mastoids? In these secondary mastoids, where we open up the old scar, we find there is a direct passage down into the middle ear through the aditus, lined with granulations in a fibrous envelope. Outside of this fibrous tissue there is more or less production of new bone. Now, if the aditus is not closed off there is no reason why this tract should not have a secondary infection, as well as the first one. The middle ear is infected up through the tube, and then the infection goes up through the aditus and through this soft space leads to the outside surface and an abscess appears. In talking this matter over with some of the New York men, the desirability of shutting off the aditus, provided it was not shut off by the proper deposition of bone, was admitted. Dench and I thought that we would put a piece of sterile rubber tissue down over the aditus. I tried it several times, but of course it was not successful, because the middle ear side of the tissue was subject to infection, while the other was imbedded in granulations, so that these little pieces gradually floated out, and I had to go back to the old packing. On talking it over with Dr. E. H. Nichols, our surgical pathologist, I asked him if a piece of periosteum would live if put down over this aditus, separated from its attachment. Of course, that would not grow unless it were nourished, and he suggested that if I could get a large enough flap from the posterior surface of the mastoid it might grow if there were large enough attachment to give it nourishment. So for the last three years, after excavating acute cases, I have been taking a very large flap of periosteum from the bone back of the ear and packing the posterior end over the aditus, bending the bone surface forward to be applied to the posterior meatal wall. I may not live long enough to know whether these cases ever become infected again, especially if they are going to last eleven or more years before they have another infection, but theoretically and certainly in most cases this flap closing off the aditus will be sufficient to avoid further infection of the mastoid cavity. The periosteum forms a layer of bone, which closes off the aditus, and the posterior or skin surface grows fibrous tissue, which assists in filling the mastoid cavity. Nichols also said that if the flap were not long enough it would contract. I found that to be the case, and therefore have had to increase the length of the flap. The ordinary curvilinear incision is made through the skin and superficial muscles, so that we have a considerable thickness of tissue. This leaves more thickness between the fascia and the bone. Then the incision through the periosteum and overlying tissue is made from the mastoid tip upward and backward along its posterior border, then horizontally backward for half an inch or more, then upward to the temporal line, then forward on this line to the posterior mastoid limit, and then upward and forward through the temporal muscle, if necessary, to meet the first superficial incision. The idea is, we have got to take rather more periosteum than we might think would be necessary. After the cavity is well excavated, this tip is put down over the aditus and packed firmly with small pieces of gauze or wicks. Then at the first dressing, four or five days after, provided the temperature has not risen, these wicks are not disturbed, but the rest of the cavity is unpacked and redressed. At the second dressing, three or four days later, on taking out the wicks, the flap will generally be found to be fastened over the aditus by firm adhesions. In some cases I did not get a large enough piece of periosteum, and at the second dressing I found that the periosteum had lifted up. I have one case here now where the periosteum had lifted up and did not cover the aditus; so I gave him ether, tore the periosteum loose where it had adhered to the posterior wall, and moved it over the hole, and now you will see that it has grown there, although it does not look so; but I have tried a probe and found it soft all the way down, with no passage into the aditus. If we have not obtained enough flap, and find that it does not cover the aditus, we can take away more or less of the posterior bony wall. We find at times that there is a good deal of tissue in the flap, making it quite thick, but this is an advantage, because it contributes to its nourishment, and also fills the cavity somewhat.

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*Stenographic report of remarks made at Boston meeting of Eastern Section of the American Laryngological, Rhinological and Otological Society, January 4, 1908.

Now it occurred to me that if we could go still further and obliterate the posterior excavated cavity which results from the radical operation, we could save the patient a great deal of trouble from the treatment that is almost always necessary at intervals, for the removal of effete epithelium, wax, etc., that is so annoying. In these cases, after taking away the posterior wall, I have taken this flap and put it right down upon the facial ridge, pushing some of it down into the aditus, which of course is open, as well as the antrum, i. e., I shut off the aditus with the flap and have its edge fastened upon the facial ridge. In that way is made a new partition between the middle ear and the posterior cavity. The posterior canal wall is split, according to the method most desirable for the case in hand, and then the middle ear and canal are firmly packed, the anterior packing being made to fill out even with the facial ridge; then the periosteal flap is adjusted to the ridge and the aditus and anchored there by firm packing as in acute cases, and the posterior cavity is packed tight. At the first dressing, several days later, we take away the lighter packing behind, and do not disturb the packing on the periosteum. At the second dressing we can take this away carefully, not, however, disturbing the packing in the canal. About the third dressing we can take this out, and in most cases, so far as I know (of course, I have not done it a great many times) the periosteum has adhered firmly in position upon the facial ridge, and the posterior cavity being then packed lightly, fills up very rapidly. Finally the middle ear is dermatized. I have not yet tried to dermatize it at the first operation, because I wish to be pretty sure that the flap was in good position. Only in one case have I had any difficulty, and in that case the lower part of the periosteum did not adhere, and there is a small cavity at the posterior inferior part of the wound. That, I think, was my first or second case. In a secondary operation I have had just lately the periosteum was almost useless, as it had a weak place in it at the middle, and the lower part sloughed out. This case proved to have an hereditary specific taint, and healed very poorly, so that the flap operation was a failure. One point I have learned to avoid in treating these chronic cases, and that is, placing the flap down there and expecting it to anchor itself and grow if the case is not a strong, vigorous and healthy one. If the healing is sluggish, the periosteum contracts and does not adhere, and therefore we have to go back to our old packing and dermatization just as before. If then the periosteum does not adhere we are not any worse off than before.

I have several cases here to show; one is a case of mastoid with hardly any pus in the cavity. I put the flap down, and it stayed, and the middle ear drained up through the external canal. The flap was not washed off or in any way compromised by the pus. In some of these cases which I have tried at the South Department, where the infection was extreme, there was a great deal of pus, and the necrosis was rapid. Here the flap always floated out. I have also tried it with the blood clot, as suggested by Sprague and seconded by Blake; but they were not successes. Now, if this firm fibrous tissue of the periosteum covers the aditus, the posterior cavity becomes a simple wound, to be filled with granulations, and the proliferation of the tissue from the posterior surface of the flap assists and hastens the process of healing very greatly. I also show two cases healed after radical operation, with no posterior cavity and the external canal only a little larger than normal; and five cases nearly healed after operation for acute mastoid. one double.

354 Commonwealth Avenue.

A Note of Hypopharyngoscopy. Harold S. Barwell. *Lancet*, August 17, 1907.

Describes the method devised by von Eicken of Freiburg of inserting a stout laryngeal probe between the vocal cords which can be drawn forward, so as to expose new growths in the post-cricoid region.

Thomson.

REPORT OF A CASE OF PROBABLE PERSISTENT ANGIO-NEUROTIC EDEMA OF THE LARYNX AND SOFT PALATE.*

BY T. H. HALSTED, M. D., SYRACUSE, N. Y.

At the meeting of this Society held in New York City one year ago, I presented for examination and diagnosis a case which excited a good deal of interest among those of the Fellows who examined the patient. The case was that of a young woman with an obscure infiltration of the soft palate and larynx, and will be recalled by some present. While in New York she was also examined, at his office, by Dr. Prince Morrow, the distinguished dermatologist and syphilologist, who was as uncertain as to the nature of the disease as were the laryngologists who examined her. I reported the case as possibly one of persistent angio-neurotic edema, and in reporting the progress of the case to-day I do so under the title of "Probable Angio-Neurotic Edema," showing the continuing uncertainty of my opinion.

Syphilis, tuberculosis, or lupus was the opinion of perhaps the majority, while a few others thought it might be the result of some undiscovered circulatory or lymphatic disturbance, or related to some disease or disturbance of some one of the internal secretory organs. Without exception, no Fellow felt confident of his opinion. Professor Killian, who examined the case with great care, thought it probably syphilitic.

Miss E. V., age 30 years, bookkeeper, living in Cortland, N. Y., consulted me on June 15, 1905, because of a thickness and fulness in the throat, dyspnea on exertion, post-nasal and nasal discharge, excoriation of left nostril, and frontal pain. These symptoms had followed a quinsy which occurred four months before, and which had not entirely cleared up after the abscess was lanced. On examination there was an apparent collection of fluid in the right anterior pillar of the fauces, the velum palati was thickened, the uvula swollen, and arytenoids were pale and swollen. There was some dry crusting over the middle turbinate and a little pus in the right middle meatus, coming apparently from the anterior ethmoid. Transillumination was negative. Nothing adventitious in the chest. No sputum. Temperature normal. She had lost ten pounds in weight during the past three months, and was on her way to the Adirondacks through the advice of her physician. I incised the swollen anterior pillar and let out a few drops of pus. I suspected tuberculous disease of the larynx and soft palate. I did not see her again for five months, when she returned and presented almost exactly the same condition as on my first examination. In the meantime she had hawked out a flat thin piece of bone, as large as the thumb nail, which had come from either the nasal septum or the ethmoid.

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*Read before the annual meeting of the American Laryngological, Rhinological and Otological Society, held at Pittsburg, May 28-30, 1908.

There was a leathery, pale infiltration of the uvula and soft palate, both arytenoids were swollen, pale pink, edematous in appearance, but leathery to the probe, pyriform in shape, the epiglottis upper surface infiltrated. No ulceration, no pain, no dysphagia, but dyspnea on slight exertion. The septum was superficially ulcerated and crusted on both sides, no bare bone detected anywhere, some ethmoidal suppuration on right side, the nose at the tip reddened, and some excoriation at nostrils. Repeated examinations of sputum were negative. Nasal scrapings were negative. Temperature taken several times a day, and for many days, was normal. Pulse normal. General health good, no loss of weight. Repeated urinary examinations by competent men were always normal. Gastro-intestinal tract was normal.

Family History.—I. have never been able to obtain a very satisfactory family history, never having seen any other of the family than the patient. Her own physicians in Cortland, first Dr. Carpenter and latterly Dr. Dana, both of whom have been greatly interested in the case, and well acquainted with the family, have never discovered any history or evidence of tuberculosis or syphilis or other constitutional dyscrasia in the family. The mother is living and well. Father died of pneumonia a month ago.

Previous History.—At six years of age patient had scarlet fever, followed by enlarged cervical glands, which finally subsided without suppuration, but an ulcer of the lip extending into the nostril persisted for four months, finally healing without scars. No other illness of note until she was 18 years of age, when she suffered a great deal from chilblains, and about this time a small swelling occurred over one heel. This suppurated, the bone was curetted, and after several months the wound healed, leaving a scar. This was said to be scrofulous.

The patient now enjoyed good general health, without any local disease anywhere, for 12 years, i. e., until she was 30 years of age, when she first came under my observation with the condition as described at the beginning of the report.

The condition then, three years ago, was a distinctly leathery, pale, swollen infiltration of the uvula and soft palate, especially of the right anterior pillar, epiglottis pinkish, edematous on its anterior surface and margins, a pale edematous pyriform swelling of both arytenoids, partially obscuring the vocal cords, which, however, were normal. In the nose was a crusting or scabbing of the septal mucous membrane, a fissure at nostril and some redness of tip. Voice was clear, slight dyspnea on exertion, with at times severe exacerbations, requiring sitting up in bed at night, these exacerbations lasting a few days and subsiding, no pain whatever either on swallowing or referred to throat or ear, no cough, no expectoration, no pyrexia. General health good. Heart, lungs, kidneys, gastro-intestinal tract all apparently normal.

Such was the condition when she came under my care three years ago. It continued the same until she appeared before this Society one year ago, with the addition, however, that a month prior to coming to the meeting she had an attack of what her physician diagnosed as facial erysipelas, differing from erysipelas in that a thickening of the lip and of the skin over the cheeks persisted after the active disease had subsided, and was present when I presented her to the Society.

After first coming to me, three years ago, repeated examinations of the sputum and nasal secretions and scrapings were made for tubercle bacilli, but none were ever found. Temperature was always normal. She was early placed on anti-syphilitic treatment extending at intervals over long periods of months, iodine in its various forms, the iodide of potassium up to 200 grains a day, and mercury in various forms, by mouth and inunction. Various applications were made locally. Nothing had any appreciable effect, the disease not progressing but not subsiding. She was repeatedly seen with me from the beginning by Dr. H. C. Baum, a dermatologist and syphilologist, and it was at his suggestion that I had her seen by Dr. Prince Morrow, of New York.

Dr. Morrow could find no evidence of any inherited or acquired syphilis, and thought the skin infiltration of the lip and face were not erysipelatous, but would not make a diagnosis. He suggested, however, the use of salicylate of mercury hypodermatically, a suggestion also of some of the laryngologists who examined her. Other suggestions made at this meeting were excision of a piece of the infiltrated tissue for microscopic examination, especially with reference to lupus, and the tuberculin test. I have not thought it wise or safe for the patient to make use of either of these two measures, desirable as they might be from a diagnostic point of view.

A course of salicylate of mercury has been given, consisting of twenty deep hypodermic injections. During the past year there has been no material change in the local condition of the uvula, soft palate and larynx. The same pale, leathery, edematous infiltration which you saw a year ago persists, although the swelling seems to be slightly less, and dyspnea is seldom complained of, and acute exacerbations of difficult breathing do not occur. The nasal condition is unchanged. In the face, however, there has been a very decided degree of activity. During the year she has had five or six attacks of what her physician at home, Dr. Dana, at first regarded as facial erysipelas, but he has now given up that opinion. Dr. Baum and I have always regarded them as angio-neurotic edemas. Without any known or apparent cause, there comes on suddenly great redness and swelling of the face, usually of one cheek, often of both, sometimes involving the dorsum of the nose and lip, no pain, but a burning sensation. This usually reaches its height in a few minutes or hours, sometimes extends, often does not. Once it occurred immediately following, in my office, a salicylate of mercury injection, so that the face became greatly swollen, cheeks deep red, one eye nearly closed, all coming on in a few minutes. Sometimes the temperature reaches 104° F. during the attacks, at other times temperature is not elevated. When these facial swellings first occurred she stayed in bed, and the disease was treated as erysipelas; of late she pays no attention to them but continues at her work as embroiderer, and finds herself recovering as quickly while up and attending to her work as formerly when she remained in bed. Since her first facial attack, more than a year ago, there has been constantly and persistently some swelling, brawny, and rather leathery, of the skin of the upper lip, right cheek, and rather edematous of the loose tissue under the lower eyelids of both sides, the so-called attacks being apparently but acute exacerbations of what I believe is a persistent angio-neurotic edema involving the face. In other words, I believe that the scene of activity has shifted from the pharynx and larynx to the skin of the face, while still persisting in these first locations. I feel certain that there is some underlying cause, constitutional or local, some dyscrasia, or some local source of toxic absorption, the nature and source of which we do not know.

831 University Block.

A Case of Ankylosis of the Stapes. R. SCHILLING. *Archiv f. Ohrenheilkunde,* July, 1906.

The patient was suffering from chronic middle ear suppuration on the right side; from vertigo, and tinnitus and progressive deafness on the left. Examination of the left ear showed diminished hearing for the low notes, negative Rinne. There was no change in bone-conduction upon compressing the air in the canal. (Gelle.)

The suppurative process on the right side lead to meningitis and death, microscopic examination of the left ear showed the presence of several areas of rarefying ostitis in the neighborhood of the promontory, one of which involved the foot-plate of the stapes, causing complete ankylosis. The usual changes in the nerves were also found.

YANKAUER.

At the last meeting of the Mississippi Valley Medical Association the following officers were elected for the ensuing year: Drs. J. A. Witherspoon, Nashville, Tenn., President; Louis Frank, Louisville, Ky., First Vice-President; Albert E. Sterne, Indianapolis, Ind., Second Vice-President; S. C. Stanton, Chicago, Ill., Treasurer; Henry Enos Tuley, Louisville, Ky., Secretary. The next annual meeting will be held in St. Louis, in October, 1909.

CONSERVATIVE TURBINECTOMY.*

BY J. A. WATSON, M. D., MINNEAPOLIS.

Every surgical operation is in a certain sense and to a certain extent an evil, and the only justification for its performance is that it should be the lesser of two evils between which we are compelled to choose. Especially is this true of operations which involve the sacrifice of organs or parts of organs that subserve special and important functions, as for instance the turbinate bodies of the nose. Since the respiratory function of the turbinates, namely the warming, moistening and filtering of the inspired air, is a function essential, not merely to health, but to continued existence, and since it can be performed vicariously by the mucous membrane of the throat and bronchial tubes only very imperfectly and with imminent danger to the integrity of those structures and of the whole respiratory system, it is evident that we have considerations quite sufficient to "sickly o'er the native hue" of our present rather enthusiastic resolution "with the pale cast of thought." There are nevertheless insistent indications for the performance of this operation. They may be epitomized as follows:

When the respiratory function of the nose, that is, its ability to warm, moisten, and filter the inspired air, is impaired to such an extent as to cause the patient serious discomfort or be a menace to his health; when further, it cannot be sufficiently improved in any other way, and when, lastly, it is evident that the contemplated operation will actually improve or at least conserve it, and not merely increase the absolute breathing space at the expense, perhaps, of further impairment of the function by destruction of a large extent of functionating tissue, we have a combination of circumstances that renders turbinectomy the lesser of the two necessary evils. This discussion excludes turbinectomy performed for the purpose of gaining access to the sinuses, or for malignant disease. It also excludes operations on the middle turbinate, though it is often necessary to remove this organ or a portion of it for the purpose of improving the nasal respiration.

Having observed this proper conservatism in the mental processes whereby we arrive at a determination to perform the operation, we must now carry our conservatism into the actual performance of it. It must be our endeavor to remove enough if possible to provide sufficient breathing space, but to leave enough to insure against serious interference with the respiratory function of the nose. Since we are obliged to steer between this Scylla and Charybdis, we must on the one hand graze the rock if necessary to do so in order to save ourselves from the depths of the whirlpool, but on the other hand we must elect to feel the suction power of the latter if we can in no other way escape being dashed upon the rock.

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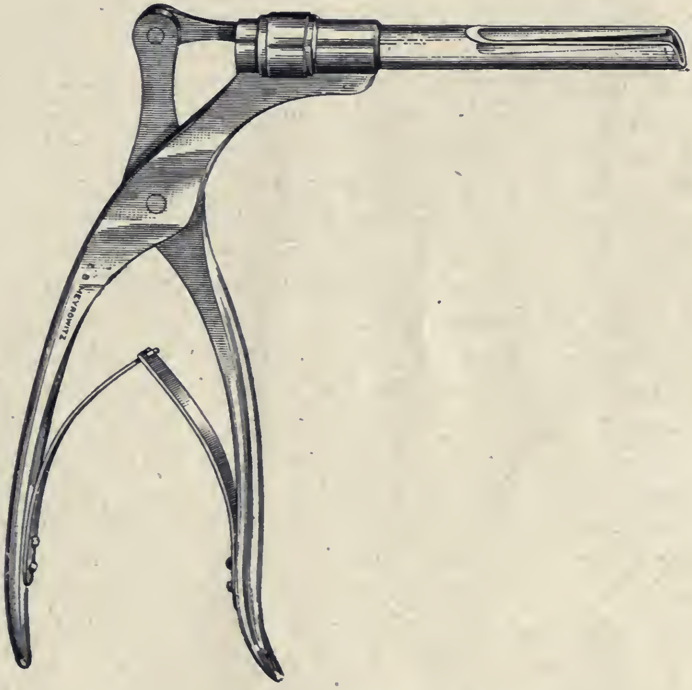
*Read before the Hennepin County Medical Society, June 15, 1908.

Apart altogether, however, from the question of the absolute amount of tissue to be removed, there are at least two other factors which must enter into our consideration of the subject, factors which have an important bearing on the one hand upon the actual breathing space to be obtained, and on the other upon the conservation of turbinate function. They are first, the site of the tissue to be removed, and second, the direction and character of the section. As far as the first is concerned, it should always of course be our object to remove only that portion of the turbinate which by reason of its situation and enlargement is the actual cause of the obstruction or at least of the greater part of the obstruction. Nevertheless it is not always possible to confine our section entirely to the hypertrophied portion, nor, as will be shown, is it always absolutely desirable even when possible. The free edge of the turbinate at least must always be included in the section whether it be hypertrophied and obstructive or not. But furthermore, the section should often be extended anteroposteriorly to include a certain amount of normal turbinate tissue in order that the section itself may preserve a desirable character and direction. On the other hand it is not always by any means necessary to remove all of the hypertrophied portion, since the subsequent contraction of the scar may be depended upon to reduce the hypertrophy to some extent, and since the above mentioned incidental removal of some of the normal tissue aids in the establishment of a proper breathing space. Bearing in mind the fact that even hypertrophied turbinate tissue doubtless always possesses more or less functionating power, it may be stated that the amount of hypertrophied tissue removed should bear as far as possible a certain inverse proportion to the amount of normal tissue which it is found necessary to remove. The more of the latter which must be removed in order to make a desirable section, the less of the former, that is of the hypertrophied tissue, should be removed, and vice versa. These various considerations bear an interdependent relationship which only experience and careful judgment will enable us to appreciate and utilize.

But what are the characteristics of a desirable section? First of all, the line of section from its anterior to its posterior extremity should be a straight line. It should be free from kinks or curves or corners or angles, such as are likely to follow any but the most careful use of scissors or forceps or any instrument which necessarily does its work by a series of bites or cuts. Especially pernicious is the practice we have all sometimes seen of cutting backward horizontally in such a series of jerks, perhaps close to the attachment of the turbinate, and then, as it were, emphasizing our approval of this angular method by chopping off the section perpendicularly at its posterior extremity with the wire snare. Such corners and angles often retard healing seriously or even postpone it indefinitely, since they are very likely to fill up with masses of granulations which refuse to cicatrize, obstruct breathing, retain secretions, and encourage crust formation. The very object of our operation is thus often defeated, for the unhealed wound with its unhealthy secretions and decomposing crusts will often irritate and congest the remaining turbinal tissue to such an extent that the last condition of the patient is worse than the first. Far better would it have been indeed to have removed a little less of the actually hypertrophied tissue and if necessary a little more of the apparently healthy tissue in order to have insured to the patient the quickest possible healing of a clean-cut, healthy wound. It is always desirable, when it is possible, to remove a V-shaped section and approximate its edges so as to leave no uncovered raw surface. Yankauer's method of removing a V-shaped section and suturing its edges together with a view of obtaining primary union would be ideal were it not that it is both technical and difficult, requiring special and complicated instruments, a much greater degree of skill than the average, and more time than can be devoted to many of these operations by a busy rhinologist. I have lately devised an instrument which I have found to be of great service in the majority of cases where it is found necessary to remove an anterior or middle hypertrophy of the inferior turbinate. It consists of an outer tube presenting on its upper aspect a slot of three-sixteenths of an inch in width. The edges of the slot are sharp, and the distal extremity of the tube is scoop-shaped, which enables the operator to engage in it more readily the anterior extremity of the turbinate. A knife, which is also in reality a section of a tube accurately fitted within the outer tube, revolves in this outer tube in such a way that its cutting edge, as it passes across the slot, shears off cleanly everything that projects into the tube, whether soft tissues or bone. The actuating mechanism consists of a collar encircling the backward extension of the outer tube, which collar slides forward in response to the closure of the convenient and forceps-like handles of the instrument. A trunion screw, surrounded at its extremity by a roller to reduce the friction, passes through this collar, then through a longitudinal slot in the backward extension of the outer tube and through a spiral slot in the backward extension of the inner tube or revolving knife.



My method of using the instrument is as follows: In most cases, at least where it is intended to include in the section the very anterior extremity of the turbinate, it is advisable to separate this extremity from its most anterior attachment to the nasal wall by a short vertical incision at this point with forceps or scissors. This step may be omitted, where the turbinate is very dependent, presenting, as we often see, a definite, free anterior edge. It is now possible to introduce a blunt instrument, such as the round cornered handle of a small scalpel or the extremities of the closed blades of a strong turbinate scissors, under the anterior part of the turbinate, and pry it away from the outer wall and towards the septum. One should in fact aim at bringing its anterior extremity opposite or nearly opposite the centre of the nasal vestibule, since such a position greatly facilitates the introduction of the instrument. It is nevertheless quite possible to introduce it in most cases without any preliminary section and prying over of the turbinate. Now, bearing in mind the conformation of the turbinate, and either with or without the aid of a speculum the turbinotome is introduced so as to engage in its distal extremity the presenting anterior portion of the turbinate. The instrument now usually slips backward without any necessity for the use of force, the edges of the slot cutting easily through the soft tissues down to the bone, if necessary, to allow of its adaptation to the irregularities of the organ. Once the anterior portion of the turbinate is engaged in the instrument, the speculum, if one has been used, should be dispensed with, as it is unnecessary and indeed impossible to any longer observe by its aid the interior of the nose, the vestibule being more or less completely filled by the turbinotome. To some extent, however, the instrument is its own speculum. One is at least able to see the anterior portion of the turbinate coming forward as it were through the bore of the instrument as the latter is passed backward. It is a mechanical impossibility to remove or injure with the revolving knife anything not included in the lumen of the turbinotome, and it is equally an impossibility to include anything but the lower portion of the inferior turbinate. The instrument should pass backward nearly parallel to the floor of the nose if it is desired to extend the section far posteriorly. The shorter the section is to be, however, the greater should be the angle at which the distal end of the instrument approaches the floor. If it is desired to remove a section of the greatest possible width, the instrument should be introduced so that the cutting slot is at its highest part, the whole instrument being at the same time crowded upwards so as to pack as much as possible of the soft tissue along the edge of the bone into its calibre. It is possible on the other hand to reduce the width of the section by rotating the instrument on its long axis in such a way as to bend the inferior edge of the turbinate more or less toward the septum and at the same time bringing the cutting slot to a relatively lower position. On closure of the handles all the included tissues are severed and usually brought away in the lumen of the instrument. Sometimes however the section is not quite completed posteriorly, owing to the lower edge of the distal extremity of the turbinotome impinging upon the floor of the nose before the cutting slot has carried the incision altogether through the edge of the turbinate. In this case the section may be completed with the snare, as all that remains of it is too insignificant to make any appreciable irregularity. The line of section is now found to be geometrically straight antero-posteriorly. But furthermore, while it is not exactly V-shaped, it is at least distinctly concave from side to side, the bone being cut about one-sixteenth of an inch higher than the soft tissues, a circumstance which greatly favors healing if the packing be so introduced as to gently compress the soft edges over the bone, but which on the other hand might greatly retard healing were the packing carelessly introduced so as to force the soft edges apart rather than together.

When the turbinate is very large, and especially when the hypertrophy extends far up above its free edge, it is a great advantage to first outline a V-shaped section along the hypertrophied portion with a small scalpel, and to separate the soft tissues from the bone for a short distance above the section. The bone with soft tissues attached along its edge is then removed with the turbinotome and the edges of the wound brought into apposition by properly introduced packing. The packing should first be be placed under the turbinate and then above the turbinate and between the turbinate and the septum.

The actual removal of the turbinate, once the instrument is in place, is instantaneous and painless. The disagreeable grating sensation occasioned by the saw and the grinding, crushing sensation accompanying the use of the forceps and scissors are alike absent. If the mucous membrane of the septum be slightly anesthetized and the turbinate fairly anesthetized, there is only the somewhat uncomfortable feeling of having the nose filled by rather a large instrument.

This instrument cannot be introduced on the side of the convexity of a deflection of the septum or of a spur or ridge which extends far forward. A turbinectomy however is practically never indicated under such circumstances. One's attention should rather be directed towards the septum. In perhaps fifteen to twenty-five per cent of adult cases, however, my experience being not yet large enough to enable me to estimate it more exactly, the pyriform opening is too small to allow of its successful use. Once it engages the turbinate there is very rarely any obstacle to its further introduction, since there is always plenty of room for one lateral half of the instrument between the turbinate and the septum, and for the other lateral half between the turbinate and the outer wall of the nose. In case adhesions between those structures should prove to be an obstacle they can be easily broken down, and it is in fact necessary to break them down whatever method is used.

Since having had this instrument manufactured I find that Pynchon of Chicago has devised a small instrument for removal of the posterior tip of the turbinate along somewhat similar lines.

Note.—During a discussion following the reading of this paper at a meeting of Hennepin County Medical Society some of the speakers took exception to the writer's use of the term turbinectomy, taking the view that this term should be applied only to operations in which the whole turbinate body was removed, and that operations involving the removal of only a portion of the turbinate should be called turbinotomy. The writer, however, cannot agree with any such nomenclature.

Iridectomy means a cutting away of a very small portion of the iris. It is not necessary to remove the whole iris in order to perform an iridectomy. Iridotomy means merely some form of incision into or through the iris. The term tonsillectomy may properly be applied to the cutting away of any portion of the tonsil A cutting into the tonsil should be described by the word tonsillotomy. Turbinectomy also properly means a cutting away of even a portion of the turbinate, turbinotomy merely an incision into the turbinate, as for instance the submucous section that is so often resorted to for the purpose of reducing congestion, and it is thus, if we would avoid confusion, that we must distinguish between cutting into any organ and the cutting away or the removal of even a portion of the same organ.

Andrus Building.

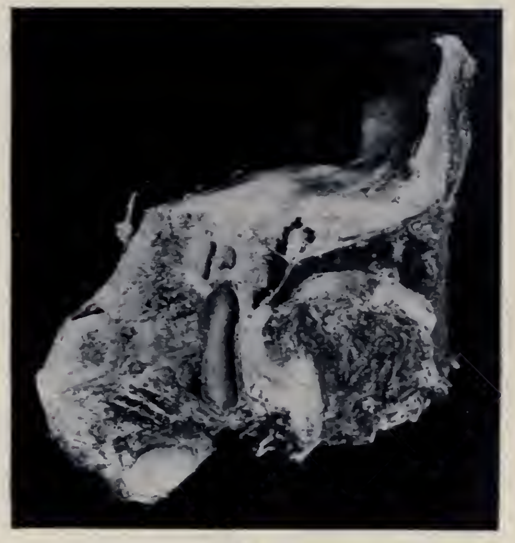


Figure 1.—Vertical section of canal and tympanum, showing definition of epitympanic space.

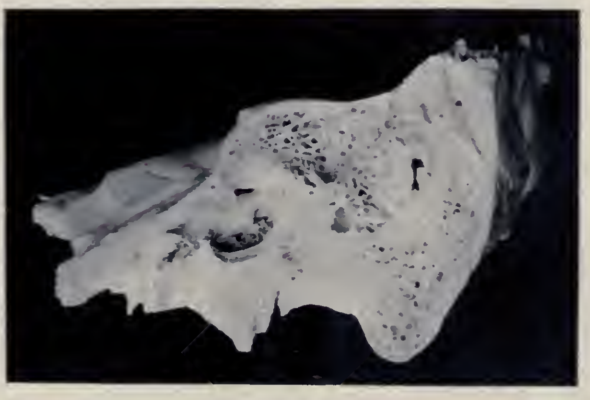


Figure 2.—Antero-posterior section of epitympanum, showing smooth-walled depressions.

PLATE I.

Plates to accompany paper of C. J. Blake:
"Contour and Contents of the Epitympanum."
The Laryngoscope, August, 1908.

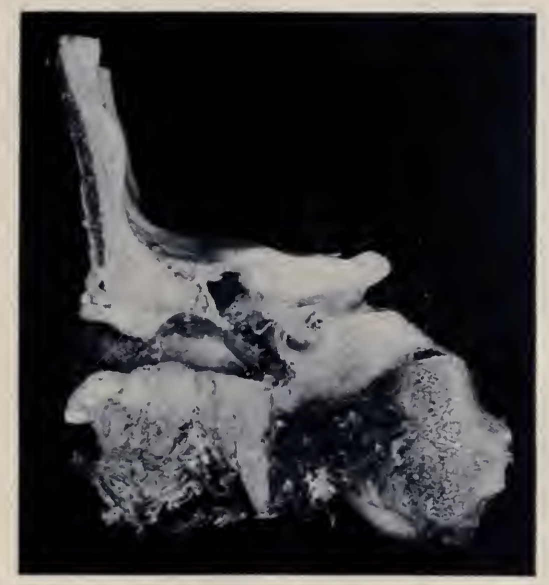


Figure 1.—Vertical section of canal and middle-ear cavity, exhibiting proportion and relationship of epitympanum to tympanum, with soft tissues in place.

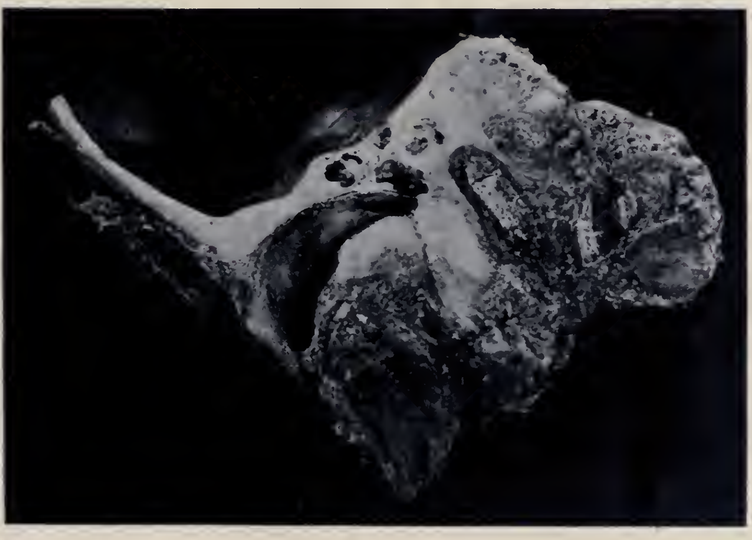


Figure 2.—Vertical section of middle-ear cavity along manubrial line, showing demarcation of epitympanum by horizontal folds.

PLATE II.

Plates to accompany paper of C. J. Blake:
"Contour and Contents of the Epitympanum."
The Laryngoscope, August, 1908.

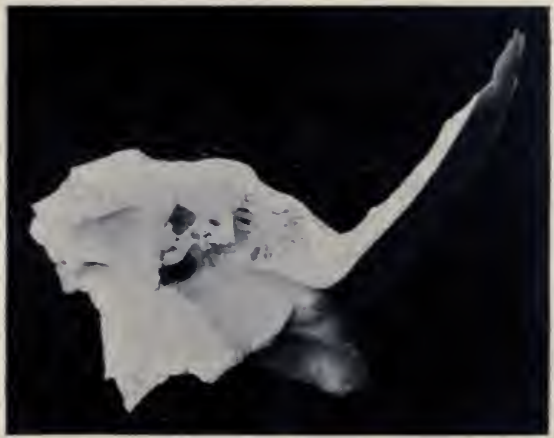


Figure 1.—Vertical section of an elevated epitympanum bounded externally by large radiate diploetic cells.

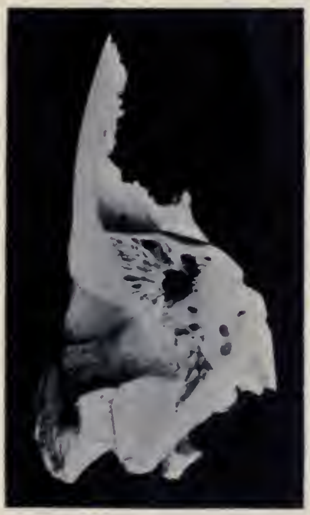


Figure 2.—Posterior space of elevated epitympanum with large radiate diploetic cells.

PLATE III.

Plates to accompany paper of C. J. Blake:
"Contour and Contents of the Epitympanum."
The Laryngoscope, August, 1908.

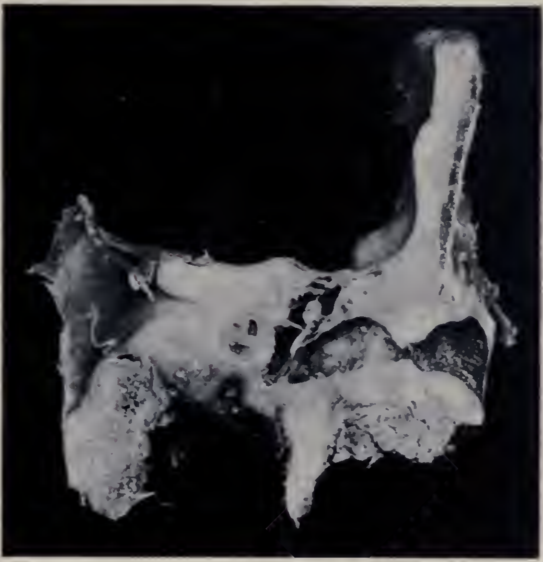


Figure 1.—Epitympanic space with long transverse diameter.

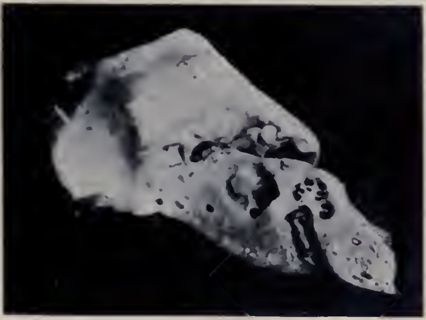


Figure 2.—Horizontal section, displaying recessus incudis and inward curve of antral wall.

PLATE IV.

Plates to accompany paper of C. J. Blake:
"Contour and Contents of the Epitympanum."
The Laryngoscope, August, 1908.

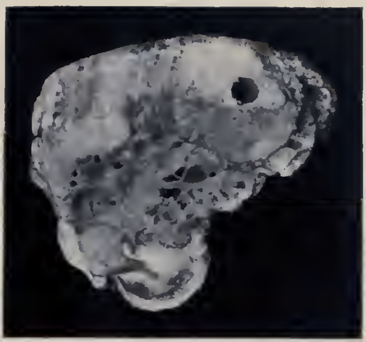


Figure 1.—Membrana tympani, malleus, incus and outer epitympanic wall, photographed by transillumination, direct.

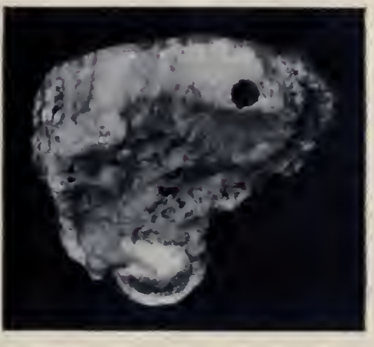


Figure 2.—Membrana tympani, malleus, incus and outer epitympanic wall, photographed by transillumination from below upward.

PLATE V.

Plates to accompany paper of C. J. Blake:
"Contour and Contents of the Epitympanum."
The Laryngoscope, August, 1908.

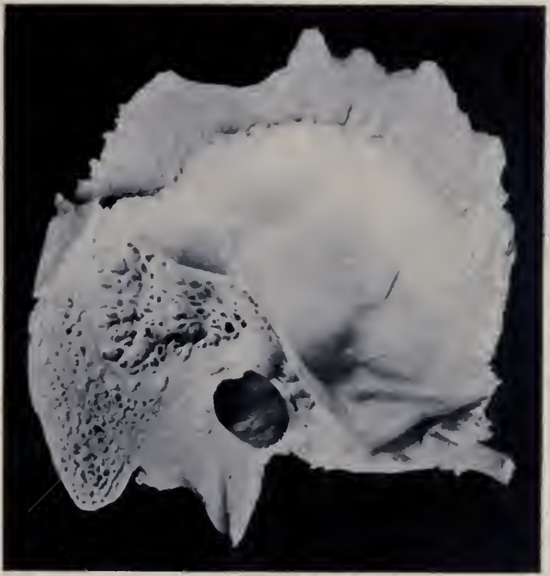


Figure 1.—Vertical section exhibiting smooth outer epitympanic wall with diploetic boundary, superiorly and posteriorly, and section of diploetic mastoid.

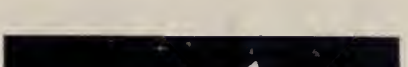


Figure 2.—Vertical section of large posterior epitympanic space.

PLATE VI.

Plates to accompany paper of C. J. Blake:
"Contour and Contents of the Epitympanum."
The Laryngoscope, August, 1908.

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

RHABDOMYOMA OF THE NOSE.

BY DERRICK T. VAIL, M. D., CINCINNATI.

Rhabdomyoma (Myoma Striocellulare, Rhabdomyoma Sarcomatodes, or Rhabdosarcoma) has been observed in the various organs of the body, most frequently in the kidney, uterus, rectum, stomach, testicle, once in the parotid gland and once on the root of the nose between the eyebrows. A single case like the following becomes interesting only on account of its extreme rarity, and, believing that all unique cases should go on record, I beg to report it. So far as I can ascertain it is the first case of its kind on record.

The patient, Mrs. L., first consulted me regarding the present trouble May 7th, 1906. She gave the following history:

Six weeks ago had the "grip," affecting the respiration apparatus and accompanied by considerable stoppage of the nose with twinges of pain in the ears. Was treated by her family physician, who, meeting with little success in relieving her of her nasal symptoms and recognizing that a change of climate would be beneficial in a general way at least, advised her to go to Atlantic City. She followed his advice, staying two or three weeks, and returned feeling much better as regards her general condition, but still complaining of nasal stenosis on the left side. She called to see me regarding the symptom, which was not painful, but annoying.

Status Praecens: Patient a spare but well nourished lady of fifty-eight years of age, presenting no external evidences of ill health and giving no symptoms other than complete stoppage in the left nares.

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*Read at the 14th annual meeting of the American Laryngological, Rhinological and Otological Society, held at Pittsburg, May 28-30, 1908.

Examination: Right naris normal; left revealed no breathing space whatever, the turbinal body being in tight contact with the septum, and the attempt to introduce pledgets of cotton saturated with cocaine and adrenalin solution met with failure. The stenosis began just within the vestibule of the nose and seemed to be entirely due to a swollen inferior turbinate. The middle fossa could not be seen. Post-rhinoscopic examination revealed the choana of the left side to be completely filled with a mass of pale tissue, light gray in color, which felt like a nodulated mass of tough tallow. The transillumination test was negative, the hearing unimpaired and the eye normal in all respects. My associate, Dr. Lamb, examined the case with me and we agreed that it "looked suspiciously like a sarcoma," although it lacked the reddish color of the sarcomata and did not bleed when wounded. We advised removal of the growth and gave a guarded prognosis.

The Operation: On June 4th, 1906, I attempted to cocainize the left naris and made more or less futile attempts at getting solution of adrenalin within the nasal cavity, but very little, if any, could be crowded along the septum on account of the impacted mass of tissue. Scissors could not be passed without puncturing and tearing the specimen. A fine straight nasal saw was passed under the growth along the floor of the nose and an attempt was made to engage the inferior turbinate in the cutting stroke. Meeting with no resistance that felt like anything, the saw was withdrawn. A nasal snare loaded with a large loop of No. 4 piano wire was insinuated along the septum until it passed the growth and the wireloop could be felt in the pharyngeal vault with the finger. The tip of the index finger of the left hand was passed through the loop of wire in the pharyngeal vault and made to pass up over the summit of the growth, and then by drawing the wire home, it slid along the finger and thus entire tumor mass was engaged. I expected to meet with considerable resistance by this large mass of tissue engaged in the wire-loop, but on drawing the wire it was delivered in the canula of the instrument without any apparent resistance. On attempting to extract the mass, I encountered considerable difficulty. I could not extract it forwards; it was too large and any attempt to grasp the front end of the mass met with utter failure for the reason that the tissue was so friable that it could not be grasped. I succeeded finally in getting it out piecemeal by the various means at my command, and extracted a wineglassful of fragmentary masses of the tumor. There was no bleeding and inspection seemed to show a thorough removal.

The specimen was hardened and sectioned by Dr. Lamb and was thought to be a large spindle-cell sarcoma by those who examined it. This information was given to her brother, who desired the specimen sent to any expert pathologist I might choose with a view of getting a positive diagnosis. Two pieces of the growth were sent to Dr. Wm. H. Welch, of Johns Hopkins University, Baltimore, and I beg to read his report in full.

Examination of Tumor from Nasal Cavity, for Dr. D. T. Vail.

The specimen is a solid grayish white elongated mass of tissue, about 1½ ctm. long and ⅝mm. broad, and of irregular shape. A part of the free surface is smooth as if covered with mucous membrane. The cut surface appears smooth and uniform. The tissue is preserved in formalin. There are two parts of the growth in the bottle, from each of which sections were cut. *Microscopical sections* show over a small area remnants of the epithelial covering in the shape of cubical cells, but over most of the surface the epithelial cells are absent. The rest of the section is composed entirely of neoplasm.

The tumor consists essentially of interlacing bundles of fibers and cells, which appear cut in different directions. The characteristic and predominant cells are elongated, band-like and fusiform cells, but large, round, oval, irregular and branching cells also occur. There are also cells with large, irregular, budding nuclei and with multiple nuclei. All of these cells probably belong to the same group and are embryonic, striated-muscle cells in various stages of differentiation or entirely undifferentiated.

The most highly differentiated cells are long, ribbon-shaped cells with one, rarely two or more, vesicular nuclei and with bodies which stain deeply with eosin. These bodies present often distinct longitudinal, delicate fibrillation, and less frequently, but in some cases distinctly, cross striation, especially at the margins of the cells. The ends of the cells appear continuous with delicate fibrils which can be traced into the surrounding tissue, either as separate fibrils or as a network of anastomosing or interlacing fibrils. These cells, which can be positively recognized as embryonic striped muscle, occur in moderate numbers scattered throughout the growth, but are most numerous in a small area near the margin of the section.

By the identification of the foregoing cells as muscular, the interpretation of other cells of the tumor as less differentiated muscular cells becomes easier. Thus there are long, flat cells with longitudinal but without transverse striation, these cells being much more numerous than those with cross striation; similar cells with smooth or granular undifferentiated cytoplasm, which, as in the forgoing cells, stain deeply with eosin; large and small, round or irregular cells with similar cytoplasm, and branching or even spider cells with delicate processes continuous with a reticulated stroma. The margins of many of the cells described appear as a glistening, single or double contoured, refractive line.

These various cells are arranged for the most part parallel to each other in interlacing bundles. When such a bundle is cut across, it sometimes happens that the contents of the cells drop out, leaving the refractive borders, so that a peculiar reticulated or honeycombed structure results, or it is possible that this appearance may be due to dissolved glycogen. There appears, however, also to be in some places a genuinely reticulated stroma, and it can sometimes be seen that fibrillar processes from the cells are continuous with this reticulum. Exceptionally on cross sections of the muscle-cells, Cohnheim's fields can be made out.

There are many elongated, round or branching cells which are without any suggestion of a muscular origin. Whether these should be interpreted as connective-tissue cells or entirely undifferentiated embryonic muscle-cells, is a matter of arbitrary judgment, but I am inclined to the latter interpretation, as all transitions between these and recognizable muscle-cells exist.

The giant cells are doubtless of muscular origin, although this too cannot always be demonstrated.

The tumor as a whole is fairly rich in cells, although in places the large amount of cytoplasm and fibrils makes the nuclei appear far apart. There are a few irregular areas of coagulative necrosis. Larger blood-vessels are not seen, but there are several wide lymphatic vessels. Genuine connective tissue is not abundant.

Diagnosis: Rhabdomyoma Sarcomatodes.

Remarks: Rhabdomyomata as rich as the present tumor in undifferentiated cells, resembling sarcoma cells, are usually designated Rhabdomyomosarcomata, but I prefer the above designation, as it seems to me probable that these undifferentiated cells are of muscular rather than connective-tissue "Anlage."

These tumors undoubtedly spring from misplaced, embryonic germs of striped muscle and are often developed at birth or in early life, although they may appear later. They are most common in the kidney, next in other parts of the genito-urinary tract, but they have been observed in various other parts of the body. In Benenati's collection from the literature of sixty-four cases (Virchow's Archiv. 1903, Bd. 171, p. 418) there is none within the nasal cavity, and I am not aware of any instance of this localization previously observed.

The majority of reported rhabdomyomata have not been malignant in the sense of metastasizing or of invasive, infiltrating type of growth. They may, however, be malignant and metastasize, especially when the growth is rich in sarcoma-like cells. I have examined specimens from two such cases of malignant rhabdomyoma, one being of the vagina and the other of the bladder.

WILLIAM H. WELCH.

There was no history of syphilis, but the patient was put on K. I. and Hg. and remedies were pushed to the point of saturation without any result.

In the meantime, the nasal cavity began to fill again and the transillumination test showed left side of the face dark. Another operation similar to the first was advised, as it was seen that the growth involved the upper turbinal wall. This was consented to and on October 15th the lateral wall of the inferior and middle meatus of the nose was rid of the same kind of growth as was found at the first sitting, and the middle turbinal body was entirely removed. It was observed at the time of the first operation that the lower turbinated bone was entirely absent —digested—absorbed—transformed or rarefied; at any rate, there was no bony framework of the inferior turbinated present. At the second operation the conformation of the middle turbinated was plainly made out, but on looking at the specimen, you will see that it, too, was rapidly losing its bony framework, being transformed into this tallow-like mass of nodulated tissue, which you can tear apart in shreds like a mass of soft papier-mache. The cavity was as thoroughly cleaned out at this second operation as possible. There was no bleeding at any time, either at the time of operation or afterward.

Soon after there was evidence of recurrence and I called a consultation with Dr. C. R. Holmes, who agreed that the growth was of unusual character, was probably filling the antrum and that a radical operation should be performed. There was no facial deformity and no subjective symptoms aside from complete blocking of the nose on that side. As the patient naturally dreaded the heroic operation proposed, it was decided to send her to New York for further advice, and Dr. Emil Mayer and Dr. R. C. Myles were consulted. I will submit extracts from their letters.

Extract from Dr. Mayer's letter:

Mrs. L. called to see me on February 1st, and I have since seen her daily for three days for the purpose of making a full report to you.

With your history to go by, the growth in her left naris, which practically occludes that side, is readily recognized as a neoplasm. It does not shrink under cocaine, nor adrenalin, is hard and bleeds readily. Nevertheless it seems to be made out to be limited to the site of the turbinate only. While it may be encroaching on the ethmoid cells and antrum, examination fails to show that. The transillumination test carefully made shows no difference on either side.

With the positive diagnosis of neoplasm, it seemed best to me to see if there was any change from the conditions found by Dr. Welch last June, and consequently I removed a small piece of the growth and referred it to the pathologist at Mt. Sinai Hospital. I enclose his report, and you will see he agrees with Dr. Welch in his report, although he did not see the striae that made it a rhabdomyoma. There are good reasons for this. You sent a large specimen, I sent a small one; yours was of the original growth, while mine was of the recurrence.

The main point is to decide if in the past six months there have been any changes in the growth indicating greater malignancy. This may now be definitely negatived.

The diagnosis is a sarcoma of rather benign tendency and we have therefore every reason to believe that its thorough removal will effect a cure.

I have given careful thought to your query as to treatment. Except for a history of several miscarriages there is no reason to suspect syphilis, and I believe you have given her full doses of KI with negative results; so I eliminate that. I have considered the possible value of X-rays and I greatly doubt their efficiency.

It seems to me therefore after careful examination, that her best interests will be in an operation which will remove the growth and the adjacent affected parts, not necessarily all of the half of the maxillary bone.

Mrs. L. complained of pain or pressure over chest and radiating into the arm. I found no chest abnormality and no glandular enlargement.

I have therefore only to verify in every way what you have done, to agree with you in the treatment heretofore, and finally to thank you for the opportunity to see so interesting and unusual a case. Very sincerely yours, EMIL MAYER.

The pathologist referred to in Dr. Mayer's letter was F. S. Mandlebaum. He made the following report:

The tumor from the inferior turbinate sent for examination is a small, hard, oval-shaped nodule, measuring from 6-8 mm. in diameter, without any special distinguishing features on the surface. On cutting it in half, its surface is greyish in color and quite homogeneous in structure.

Microscopic Examination: When viewed with the low power, the entire central portion appears more or less degenerated and stains quite poorly as compared with the peripheral parts. With the higher power the central portion shows that the degenerative process has ceased before complete necrosis, and the component structures are still faintly visible The peripheral zone shows distinctly the character of the growth, which extends quite to the surface and is not covered by mucosa.

The growth is composed almost entirely of well-defined cells with more or less parallel margins and of variable lengths. The ends of these cells are frequently drawn out to a thin filament, and often merge into the conective tissue stroma. These cells stain readily with eosin and with picric acid. No striations can be seen. The nuclei of the cells are vesicular and very rich in chromatin, and vary greatly in size and shape, but for the most part are rather broad and oval and resemble those of the heart muscle. Here and there scattered between these cells are other large cells of irregular shape, with large nuclei, and occasionally a giant cell with multiple nuclei is found. The cells that comprise the greater part of the tumor are unquestionably muscle cells in various stages of development. Where bundles are cut transversely, the typical appearance of muscle tissue is apparent. In those parts where the muscle fibers are less numerous, a stroma of delicate connective tissue fibers, branching and interlacing, is seen. In the meshes of this stroma a few mononuclear leucocytes are present. No distinctly embryonal connective tissue fibers can be made out. No mitosis, either typical or atypical, is present. The central portion of the tumor, as far as it is possible to make out, consisted of similar structures prior to its degeneration.

Blood vessels are not numerous in the section. Those that are seen are thin-walled and show no lesions.

Diagnosis: Myosarcoma (leiomyosarcoma).

With many thanks for your courtesy, I am

Very sincerely yours, F. S. MANDLEBAUM.

Dr. Myles' report on the case was as follows:

In my opinion Mrs. L. has a malignant growth in the nose. The anterior area could not be properly observed on account of the closeness of the septum to the outer wall and the considerably bruised edema probably due to manipulation. The inferior turbinal can be easily observed through the posterior nares. The posterior half of the inferior turbinal is larger than it should be; its middle and anterior part appears nodular and roughened (by posterior rhinoscopy aided by retraction of the soft palate.) The neoplasm is extending outward, upward and forward toward the nasal process of the superior maxillary bone and the nasal vestibule.

I would advise a radical operation by making an incision beneath the eye down to or through the lip and resection of a part of the superior maxilla. The growth seems to be confined to the anterior half of the nasal fossa. Of course the tissues should be removed a certain distance beyond the apparently healthy lines.

Very sincerely yours, ROBERT C. MYLES.

It was decided to have Dr. Jos. Ransohoff, a general surgeon of Cincinnati, perform the operation, as it was thought the growth may have extended to such territory that the upper jaw might have to be removed together with the entire accessory sinus framework on that side. On February 9th, Dr. Ransohoff examined the case thoroughly and agreed that the external operation (radical removal) was necessary.

On February 12th at the Jewish Hospital the patient was operated on as follows:

Anesthesia by Dr. Iglauer—chloroform. Preliminary laryngotomy and tube inserted; pharynx stuffed with gauze. This was decided expedient on account of the likelihood of dangerous and annoying hemorrhage and to facilitate the giving of the anesthetic. An incision was carried from the inner angle of the left eye down the side of the nose around the ala nasi and thence outward parallel with the lip. The periosteum was stripped back and the front wall of the antrum together with a part of the nasal bones were removed with the bone forceps. It was then seen that the tumor mass completely filled the antrum of Highmore and was not adherent at its limitations.

The removal of the entire mass was easily accomplished by simply lifting it out of its nest. The confining walls were thoroughly inspected for ingrowths of the tumor, but none were found. The cavity was packed with iodoform gauze and the wound closed by interrupted sutures. The tracheotomy tube was removed and sutures applied, closing the opening in the larynx.

During the entire operation, which occupied only about twenty-five minutes, the patient had a bluish, cyanotic color, her pulse was thready and the heart lacked tone. The patient rallied from the anesthetic so far as the regaining of consciousness was concerned and did not complain of her respiration. Her breathing was deep and normal, but the heart did not rally and in spite of the employment of every known means of restoring the cardiac power, the pulse continued small and thready, and sixty-eight hours after the operation the patient died.

Stengel, in his 1906 book on Pathology, speaks of Rhabdomyoma as "containing more or less striped muscle fibers, usually a small amount, the main body of the tumor being made up of sarcomatous cells.

Etiology: It is thought to be a congenital defective development, and usually occurs in early life and in situations where unstriped muscle fibers do not normally exist. The kidney is the most frequent seat of involvement.

Structure: The microscopic appearance is usually that of a spindle-cell sarcoma, containing more or less striped muscle fibers. There are elongated spindle-shaped cells, partly striated and suggesting embryonal muscle tissue and rarely more fully developed muscle fibers. Large areas may contain no muscle fibers at all, while certain portions are richly supplied.

The tumors are malignant in proportion as the sarcoma elements are predominant, but metastases are infrequent.

I have no doubt that rhabdomyoma of the turbinates has been encountered, but has never before been recognized. The appearance as it exists in the nose is that of a lardaceous or suet-like nodular mass of friable nonvascular tissue. These tumors going to the laboratory for microscopic diagnosis are called large spindle-cell sarcomata.

When one considers that within the nasal structures striped or voluntary muscle fibers do not normally exist, he wonders that such a tumor in this locality could occur. The only plausible theory for its occurrence in a locality of this sort is that one of the neighboring voluntary muscles, such as the levator labii superioris alaquae nasi or depressor anguli nasi, has a prototype embryologic, misplacement lying dormant within the nasal cavity and for some reason took on active sarcomatous growth late in life.

A complete bibliography on the subject is published in Ziegler's "General Pathology," 1903, page 406.

No. 24 East Eighth Street.

An Isolated Primary Carcinoma of the Trachea. RICHARD HOFFMANN. *Monatsschrift f. Ohrenheilkunde*, August, 1905.

A man 49 years of age was referred to the author for a diagnosis of an alleged laryngeal growth. No sign of such a growth could be found. Nine months later the patient presented himself again and on the occasion a dark red papillary tumor could be seen situated in the upper part of the trachea. Two days later the growth again disappeared from view, but reappeared again upon a subsequent examination. Operation was refused. About seven months thereafter marked dyspnoea set in, with a pronounced cough. The tumor was now as large as a cherry. Operation was decided upon, and the patient was anaesthetized. As soon as primary anaesthesia was obtained the skin incision was made. The patient immediately became cyanotic and died. The autopsy showed some enlargement of the thyroid, encroaching somewhat upon the trachea posteriorly; a persistent thymus; an open foramen ovale. The tumor, which nearly filled the lumen of the trachea, extended over four tracheal rings and proved to be a primary epithelioma. YANKAUER.

THE RELATIONSHIP BETWEEN DEGENERATE TONSILS AND MIDDLE-EAR DEAFNESS.*

BY J. N. REIK, M. D., BALTIMORE.

It is the object of this paper, as indicated in the title, to consider the possible effect of the so-called "degenerate tonsils" in the production of middle-ear deafness, and the manner in which they may act in bringing about pathological changes in the middle-ear cavity; not to discuss the effect of those general hypertrophies of the tonsils and lymphoid ring, so commonly met with in childhood, the relationship of which to middle-ear deafness is so well understood and conceded. The cases reported in this communication occurred in adults, who consulted the otologist for the relief of deafness, and who did not complain of any throat or nasal symptoms until questioned regarding recurrent or constant slight pharyngeal irritation or voice impairment, when on careful examination diseased tonsils were found. The fact that the complete enucleation of such tonsils has, in a number of cases, improved, arrested, or even cured cases of beginning or progressive middle-ear deafness and tinnitus, without other treatment, leads to a consideration of the manner in which these tonsils may possibly act in producing such pathological conditions in the ear.

Middle-ear deafness may have its origin in at least three ways: First, it may result from the extension to the tympanum of inflammatory conditions in the adjacent tissues of the Eustachian tube or pharynx; second, it may be due to alterations in the vascular supply of that cavity; third, it may be due to interference with proper and adequate ventilation of the tympanum through the Eustachian tube.

A case seen last week shows very clearly the working of the first named process, a pathological condition which is understood and conceded by all, though in cases similar to this one the originating disease focus may easily be overlooked.

L. G., a boy of five years, was observed December 17th, 1907, with the parents' statement that during the early hours of the morning the child had developed severe earache on the left side, which subsided after a few hours with the use of hot applications.

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*Candidate's thesis, presented at the meeting of the Southern Section of the American Laryngological, Rhinological and Otological Society, held at Baltimore, December 27-28, 1907.

At the age of two, after an attack of middle ear disease, he had been subjected to an operation for the removal of adenoids and tonsils, the guillotine instrument being used. Examination showed the left tympanic membrane bulging in its posterior inferior quadrant under the pressure of probable serous exudate. There was no fever nor pain at the time of examination. Naso-pharyngeal examination showed a remnant of lymphoid tissue over the vault, extending from the orifice of one Eustachian tube to that of the other. On the right side was a medium sized tonsil, projecting somewhat beyond the pillars, while on the left side there was a submerged tonsil, which contained a few white points.

An operation under general anesthesia was performed, the adenoid tissue being removed by curettement, and both tonsils dissected out. The interesting point in this case is that the small submerged left tonsil—on the same side as the acutely inflamed ear—contained a considerable amount of pus, which was discovered only by accident when the tonsil was cut for examination; in other words, it contained an apparently encysted abscess. Paracentesis of the left tympanum evacuated a quantity of sero-purulent fluid.

The tonsils often show the first signs of infection, to be later followed by middle ear involvement. The organisms in the mouth may gain entrance through these tonsils and produce disease of the middle ear just as they cause joint involvement and cardiac disease. Any of the organisms which are generally lurking in the mouth or in these diseased tonsils (usually one of the forms of cocci) may also be conveyed to the tympanic cavity from these tonsillar breeding places by the blood or lymph channels. It is therefore of great importance in every case of ear involvement to give close attention to these glands lest a diseased condition be overlooked, and complete destruction of these foci, by enucleation of such tonsils, should be a preliminary to any other form of treatment. It is hardly necessary to go into detail regarding such examination, but where the patient does not complain of any throat trouble, the otologist is very likely not to make a searching examination of these glands with a probe, and so, very often, such foci of disease are overlooked or ignored, as they can be discovered only by pulling forward the anterior pillar and probing the hidden crypts and recesses of the tonsils.

It is, however, to the possibility of these tonsillar masses acting mechanically to supply the other two causes, vaso-motor changes and impaired ventilation of the middle ear, that I would particularly call attention. The return of blood from the middle ear is in part through veins running superficially through the mucous membrane of the Eustachian tube into the lateral pharyngeal veins, and any mechanical pressure on the lateral walls of the pharynx may unquestionably result in a blood stasis of these small vessels.

Regarding the blood supply of the middle ear, Gruber[1] says: "The middle ear receives its blood supply from the external and internal carotid arteries. The branches specially distributed to it are:

(a) "Small branches from the arteria pharyngea ascendens supply the tuba Eustachii and its muscles, and some penetrate the mucous membrane of the tympanum to supply it."

(b) "The arteria stylo-mastoidea, a branch of the arteria auricular posterior in its passage through the canalis Fallopii, gives off small branches which enter the tympanic cavity through its posterior wall."

(c) "Small branches of the arteria temporalis pass through the Glasserian fissure into the tympanic cavity." He says further, "The venous blood is drained away by veins which accompany these arteries, and which pour it into the venous plexuses near the temporo-maxillary joint, into the veins of the pharynx, and also into the middle meningeal veins."

Mechanical pressure, quite sufficient to prove obstructive to a venous flow of blood, may be readily produced by even a small tonsillar mass, especially if it be in a diseased state, with accompanying oedema of the deeper tissues. It is much more likely to be produced by the degenerate, submerged tonsil than by the simple hypertrophic tonsil or adenoid. It is often evident on careful examination that even though the tonsil does not project beyond the pillars into the throat, and though practically invisible on casual inspection of the pharyngeal cavity, yet on drawing aside the tonsillar pillars or lifting the tonsil out of its bed with tenaculum forceps, a large tonsillar mass lies deeply buried under the pillars, in just the position to exert marked pressure on the lateral pharyngeal walls. The large hypertrophic tonsils so common in childhood are not so apt to act in this way, because the bulk of the hypertrophied tonsillar mass in such cases projects into the throat and there is, in consequence, no backward pressure upon the vessels.

When venous stasis in the deep pharyngeal vessels is produced, there follows a hyperaemic condition of the mucous membrane of

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(1) Disease of the Ear, Gruber, 2nd Amer. Ed., 1893, p. 87.

the tympanum, and if it be continued, a serous exudate into this cavity, with the attendant possibilities of such a condition produced in any other way.

Furthermore, a condition of venous stasis naturally interferes with the reception by the tissues of the normal amount of arterial blood, and consequently there is a trophic disturbance of the tissues that may likewise result in impaired function. Franklin H. Hooper,[2] in his excellent article, written many years ago, on the evil consequences of adenoid growth pointed out the possibility of vaso-motor and trophic disturbances of the tympanic cavity, resulting reflexly from any inflammatory irritation in the naso-pharyngeal region, and Politzer,[3] who believes he has proven a close anastomotic connection between the vessels of the middle ear and those of the internal ear, says: "This relation of the tympanic mucous membrane to the osseous wall is of special importance inasmuch as inflammation of this membrane can produce transitory or permanent hyperaemia, and disturbances of nutrition in the bone and in the labyrinth."

The third mode of action and the one to which I would most especially direct attention is that whereby the tonsillar mass may interfere with the function of the Eustachian tube. Under normal conditions this tube is patent, but not open, its superior-posterior lip lying in contact with its anterior-inferior. It is regularly opened for the admission of air to the tympanum in certain involuntary muscular actions, such as the process of deglutition, and the making of certain sounds in phonation. This act of opening the orifice of the tube is accomplished by the delicate mechanism of the tubal and palato-tubal muscles; the tensor palati, levator palati and dilator tubæ. During deglutition the soft palate is raised and put upon the stretch by the levator palati and the tensor palati muscles. The lowest muscular structure of the soft palate is the palato-glossus, arising from the side of the posterior part of the tongue and running upward to the under surface of the soft palate, where it spreads out and becomes continuous with that of the opposite side; this forms the anterior tonsillar pillar and aids in promoting the tension of the soft palate in the act of swallowing. The palato-pharyngeus forms two muscular strata in the soft palate, enclosing between them the levator palati muscles, these two strata coming together outside the soft palate to be joined by two delicate muscular slips which spring from the lower bor-

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(2) Boston M. & S. Journal, 1886, pp. 198-7.
(3) Diseases of the Ear, Politzer, 1903, p. 37.

der of the cartilage of the Eustachian tube, and are sometimes described as the salpingo-pharyngeus muscles. Spalteholz refers to these as the salpingo-pharyngeus, and says that they are attached to the lamina medialis cartilaginis tubae auditivae. The palato-pharyngeus thus formed, and intimately connected with the tube, arches downward and backward as the posterior pillar of the tonsil, to be inserted into the thyroid cartilage, some of its fibres extending backward to be inserted into the pharyngeal aponeurosis.

The levator palati, which, as has just been said, is enclosed between the layers of the palato-pharyngeus, is a round, fleshy muscle arising from the lower, inner border of the cartilage of the Eustachian tube.

The tensor palati, which lies in front of the levator palati, is flat and band like, arising from the scaphoid fossa, from the outer aspect of the Eustachian tube, and ending in a tendon which turns under the hamular process; in the soft palate this tendon expands below the deep part of the palato-pharyngeus (posterior pillar) to be inserted into the transverse ridge of the palate bone.

A muscular slip, which descends from the outer margin of the cartillage, in relation to the outer, unprotected side of the Eustachian tube, and which joins the tensor palati, has been termed by Rudinger the dilator tubae. The palatal aponeurosis extends backward from the posterior margin of the palate, and a portion of the deep fibers of the palato-pharyngeus, some of the fibers of the levator palati, and the tendon of the tensor palati have attachment to it.

It may be seen from this consideration of the mechanism of the Eustachian tube muscles that their action is intimately connected with that of all the palatal muscles and with the so-called tonsillar pillars, and anything that interferes with the normal act of deglutition may affect the palato-tubal function.

Is it not conceivable, then, that interference with the action of these muscles may be occasioned by the presence of a tonsillar mass adherent to or causing a low grade of inflammation of the tonsillar pillars, and may not the improvement in the auditory conditions following the complete enucleation of these masses be due sometimes, or in some measure, to a freeing of these muscles?

Francis H. Hooper, in his article referred to above, says: "Finally, these adenoid growths may cause paresis of the palato-tubal muscles, and thus be a factor in the production of so-called 'paretic deafness.' " It would seem to me that this statement might be applied as well to these tonsillar masses.

Blake and Reik in their recent book[4] say "that the ventilation of the ear through the Eustachian tube is assured by the action of the lavator and tensor palati muscles which are attached to the soft palate at one end and the anterior walls of the tube at the other, and that contraction of the palatal ends of these two muscles causes a corresponding movement at the tubal ends, the result being a withdrawal of the interior from the posterior wall of the tube, and at the same time a depression of the inferior wall or floor of that passage, giving it a greater inclination downward towards the pharynx. The same movement which opens the tube tends to compress the air in the naso-pharynx, thus favoring still further the ventilation of the middle ear." They also say "that with the presence of adenoid growths in the naso-pharynx this admirably working mechanism is interfered with, even when the growth is not large enough to occlude the orifice of the tube, as it interferes with the palatal movements and with the proper balance of air pressure in the naso-pharynx. Even a small growth may thus interfere with the palatal movements, as is shown by the effect which it has upon the pronounciation of the nasal consonants, that is to say, upon the palatal movements." This is certainly equally true of these tonsillar masses.

It would seem to me that in most of the cases to be referred to there was not sufficient inflammation of the tonsils to alone account for the aural symptoms. In fact, in only one, which has been already related, was this explanation applicable.

We know that hearing is diminished whenever the air pressure within the tympanic cavity is allowed to become less than the external atmospheric pressure, and the pressure within can only be kept the same as that of the outside atmospheric pressure by the regular uninterrupted opening of the pharyngeal tube orifice. If the tube is kept closed the blood vessels of the tympanic wall take up the oxygen from the imprisoned air and give off carbonic acid gas in exchange, but the amount of the latter given out is less than the amount of the oxygen removed, so that the total quantity of gas within the closed cavity is reduced and its pressure consequently becomes less than that of the atmosphere—the membrana tympani is cupped inward, and the increasing tension of the membrane may occasion deafness or dulled hearing, before any exu-

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(4) Surgical Pathology and Treatment of Diseases of the Ear, 1906, pages 288-292.

dative condition within the cavity has occurred. If this state of affairs continues an exudative inflammation is soon started up, and if this cause, or such exudative inflammation, can be removed before nature has transformed the exudate into embryonic or adult connective tissue, graver consequences may be prevented.

The operative procedure in the cases to be related was that of separation of the tonsillar pillars and complete enucleation of the tonsils, with dissecting forceps and a sharp bistoury, thus leaving the muscular pillars clean and free to perform their function.

The ordinary tonsillotomy, even in such cases as might admit of that operation (that is, if the tonsils projected beyond the pillars), would not act in this manner, of course, as there would still be left a tonsillar stump, besides which the injury to the delicate muscles of the tonsillar pillars attending such operation would still further hamper their action, instead of improving it. Moreover, it is the tonsils which, instead of projecting into the throat, extend backward behind the pillars, the so-called submerged tonsils, that are encountered in these cases, and nothing but their complete enucleation is indicated, and, of course, nothing short of that could be expected to have any influence on the conditions described. Furthermore, even in the cases of large hypertrophied tonsils, in patients already predisposed to pharyngeal deafness, tonsillectomy by dissection is to be recommended, because tonsillotomy by the crude method of the guillotine may injure the delicate muscle slips running in the tonsillar pillars, and thus still further weaken the already defective action of the palato-tubal mechanism.

Though the aid of intact and perfectly functioning tonsillar pillars may not be absolutely necessary to a proper functioning of the tube, in all cases, yet in certain cases of weak tube action just this additional aid may be needed. Inflation of the middle ear by means of Politzerization and catheterization is of only temporary benefit in these cases. It should be our aim to restore to the tube its function of properly opening itself.

The following cases are a few of those accurately observed, and serve to illustrate the relationship referred to:

Mr. H. L. of Wisconsin, first examined April 3, 1907, because of subacute otitis media of recent origin, accompanied by pronounced deafness and sense of "stuffiness" in both ears. His condition had followed an acute naso-pharyngitis, but he had been subject to recurrent attacks of slight otitis for the past year or so.

Examination of the ears showed a hyperemic condition of both membrani tympani, with probable serous exudate in the cavity. Gentle catheterization relieved the condition temporarily. He had degenerate submerged tonsils, which had not been giving him any trouble.

Hearing tests showed: Watch R. and L., c.40; bone conduction, R. and L. 15.15; air conduction, 10.30; Weber equalized.

On May 1, one week after a complete tonsillar dissection, and without any aural treatment after the first visit, his hearing had improved to ability to hear ordinary conversation, as against only very loud conversation before. Watch, R. 20.40, L. 8.40; air conduction, R. 20.30, L. 15.30. At that time he left the city, but has been heard from within the past month, and is reported to have perfect hearing, with no complaint of aural or pharyngeal trouble.

Mr. D. L. W., first examined April 9, 1907, complaining of long standing deafness in the left, and recently increasing deafness in the right ear. He believed his deafness in the left ear had been congenital. Aural examination showed the right tympanic membrane slightly retracted and hyperaemic. During the past few months his deafness on the right side had shown a marked tendency to increase, and it was becoming difficult for him to hear ordinary conversation or to enjoy public lectures. The changes in the tympanic membrane were slight, but he had a small, ragged, submerged, bad-looking left tonsil, and a very large right tonsil, which was adherent to the tonsillar pillars.

Hearing test showed: Watch, R. 20.40, L. 0.40. Low tone limit, R. (c. 64 v. s.); L. (c. 256 v. s.); bone conduction, R. and L. 10.10; air conduction, R. 15.20, L. 7.20; Weber lateralized to left.

A double tonsil enucleation was advised and operation performed April 14. On April 22 hearing test showed: Watch, R. 30.40, L. c.40; air conduction, R. 18.20, L. 10.20.

In the latter part of May a further test showed that the left ear maintained the same condition, while the right had improved to normal hearing.

Miss S. E. T., Ellicott City, seen May 24, 1907, complaining of increasing deafness in the right ear and a chronic deafness in the left ear which had existed for four years. Both membranae tympani presented the appearance of chronic exudative otitis media, slight retraction and thickening, and hearing tests showed marked interference with the transmitting apparatus.

Air conduction (c. 512 v. s.), R. 13.20, L. 15.20; watch, R. 15.40, L. 20.40; Weber equalized. Low tone limit (c. 64 v. s.).

She had a slight hypertrophy of the right inferior turbinate and submerged, degenerate tonsils, with white, cheesy material in the crypts. Complete tonsil enucleation was performed on June 1.

Unfortunately no record was made of her hearing tests immediately after. She went away for the summer, had no treatment whatever, but returned on October 9, to report that she had been perfectly well in every respect, and hearing tests at that time showed: Watch, R. and L. 30.40; air conduction, 20.20.

I have seen her within the month and she declares that her hearing is perfectly normal.

Miss B. H., Washington, aged 33. First seen October 1, 1907. She came for relief from deafness, tinnitus and occasional attacks of throat inflammation, which she said had existed in some degree for three years.

The right tympanic membrane was thickened, slightly retracted, and the left one markedly so. She had tried various drugs and forms of aural treatment, including a course in Christian Science. Ordinary conversation was heard with great difficulty, and only in a quiet room.

Hearing tests showed: Watch, R. and L. 0.40; low tone limit (c. 128 v. s.); bone conduction, 10.10; air conduction, R. 10.20, L. 7.20.

Pharyngeal examination showed a degenerate submerged left tonsil of fair size, and a smaller but more degenerate one on the right side, the pillars and tonsil on this side having the appearance of being all matted together. Nasal condition was normal; large but not obstructive inferior turbinates.

A double tonsil enucleation was done on October 3. Her hearing improved in both ears, and on October 15 hearing test showed: Watch, R. 4.40, L. 0.40; air conduction, R. 19.20, L. 14.20; whispered voice at six feet; conversational tone at 18 feet. The tinnitus, she said, was scarcely noticeable, though still existing to a slight degree.

Mr. B. L., North Carolina, seen December 6, 1906, because of a slight loss of hearing in the right ear. He complained also that there was a sense of "stuffiness" in that ear, with occasional attacks of pain. The condition had existed for some months, with various periods of improvement and recurrence, and was becoming quite annoying.

Aural examination showed a subacute otitis media, the tympanic membrane being congested about the periphery particularly and slightly retracted. Hearing test: R. E.: Upper tone limit normal; lower tone limit (c. 64 v. s.); air conduction, 15.20; bone conduction, 10.10; Weber referred to right.

Examination revealed small submerged, degenerate tonsils on both sides. With the Eustachian catheter air could be introduced into the tympanum, but with some difficulty and with only temporary improvement. His engagement as a student prevented operative procedure at once, and he was treated with sprays and applications and catheterizations for some weeks, when he submitted to operation.

Almost immediately the aural affection, which had persisted all the time, disappeared, and this result has been permanent, for a report from him within the month says that he is perfectly comfortable, and that there has been no recurrence of the ear trouble; that his hearing is normal.

Mr. J. D., Ohio, seen January 22, 1907, complaining of irritable throat and dullness of hearing. He said that his throat was more or less constantly sore, that his voice failed after a very short period of use, and that his friends had begun to complain of his impaired hearing. Hearing tests: Watch, R. E. C.40, and L. E. 140; whisper, R. E. 8 feet, L. E. 10 feet; acoumeter, R. E. 10 inches, L. E. 15 inches; bone conduction normal; air conduction, R. E. 10.20, L. E. 12.20; upper tone limit normal; lower tone limit (c. 128 v. s.); Weber not lateralized.

On examination of the throat and nose there was found small diseased, submerged tonsils, an elongated uvula, and a hypertrophied inferior turbinate on the right side. The tonsils were dissected out and the uvula clipped. Four days later, when I next saw the patient, there was marked improvement in his ability to hear the voice, and he stated that he could hear much better. There had not at any time been any notable alterations in the tympanic membrane, so that no changes could be observed there, but his hearing now rapidly improved until his air conduction for the tuning fork (c. 512 v. s.) became 20.20, and he could hear the whispered voice at 20 feet and the watch at 15.40. This was without any treatment whatever directly to the ear.

In October he reported through a friend who was coming to Baltimore that he is perfectly well, can use his voice all day without tiring, and hears quite as well as anyone.

Miss G. E., Mt. Washington, first seen January 28, 1907, complaining of recurring attacks of earache, involving the left ear particularly. The left tympanic membrane was hyperemic at the time, the membrana flaccida being most congested, while the membrana tensa was retracted. There had been considerable pain during the night before and periodic attacks of soreness for a week. Both tonsils were large, inflamed and adherent to the faucial pillars. Her mother desired postponement of operative treatment for a while in order to permit completion of some school work, and consequently local antiseptic and astringent applications were employed until the month of March.

At that time hearing tests showed: R. E. and L. E. watch, 20.40; bone conduction, R. E. and L. E. 10.10; air conduction, R. E. 10.20 and L. E. 8.20; Weber not lateralized. On March 4 both tonsils were enucleated and a small adenoid removed. No treatment to the ears was instituted until March 20, when the hearing had markedly improved, air conduction for the fork having increased to 15.20 for the right and 12.20 for the left, while the watch could be heard at 30.40 in each. Politzerization, the use of chloroform vapor and massage caused a further improvement, and on April 10 air conduction was R. E. 20.20 and L. E. 18.20, a condition which she retains at the present time without any further treatment. The gain of 50 per cent in auditory function within two weeks after tonsillectomy and without any aural treatment is striking.

From a study of these cases, seen in private practice, and others of a similar character treated in the dispensary, the importance of carefully looking for these diseased glands, and getting rid of them completely when found, in all cases of beginning or progressive middle ear deafness, has been impressed upon me; not that the enucleation of such degenerate tonsils will always arrest the progress of or cure the condition, but that it will eliminate at least one of the possibly important factors in the production of such condition.

No. 412 Cathedral Street.

THE POST-OPERATIVE EFFECTS OF THE STACKE OPERATION.*

BY JAMES F. MCKERNON, M. D., NEW YORK.

The programme gives the title of this paper as the post-operative effects of the Schwartze-Stacke operation, but this is incorrect, as I shall speak only of the effects of the Stacke operation.

When a patient consults us for the best methods of curing a running ear that has persisted for a long time, there are many points which we, as otologists, should consider. First of all, is it necessary that a radical should be done? If dead bone be present in the tympanic cavity the answer is in the affirmative, but there are many cases where the patient is advised to have this operation performed on account of a discharge from the middle ear, which has been in existence only a few weeks or months, and where no dead bone can be demonstrated. In this class of cases I believe it is a very unwise procedure. I do not wish to be understood as opposed to this operation, when there are indications distinct and definite for its performance, for when these are present, I do not know of any other method of treatment that offers the patient such complete relief and safety. From personal observation, however, I believe it is frequently advised and performed where there is absence of necrosis, and before other measures of a more conservative nature, in the way of local treatment, have been exhausted. In discussing the post-operative effects, the question of the percentage of recurrences is an important one. It is my belief that fully one quarter of the total number operated upon lapse into the recurrent class, and yet many operators will tell us that the number of their recurrences amounts to only four or five per cent, and they are right in believing this, for a large number of these cases operated upon from clinical material in the hospital pass out from their immediate observation in from two to four weeks, and drift to other hospitals, where they again apply for treatment for a discharging ear. The cause of these recurrences is not always failure to remove all the dead bone, though frequently such is the case, but many of them are the result of faulty technique in dressing after they have been discharged from the hospital wards. It is just as important for the cure of the patient, that he who dresses the case after operation should have had experience in this special line of dressings, as it is that the operator should have had experience in his field, and many an operator would have more complete cures to his credit, were he to follow up and dress his cases personally. Failure to properly rim out and remove all diseased tissue at the tympanic orifice of the Eustachian tube is also the cause of a certain number of these recurrences. But a still further cause acting by the way of the Eustachian tube must be considered, and that is, that many of these patients contract colds easily, the tubes become infected, and this extends to a mass of new scar tissue lying over the tube with the result that it becomes broken down, and a direct communication is once more established between the tympanic cavity and pharynx. The cause for such an extension in a large number of the cases is due to the mechanical obstruction in the naso-pharynx by a mass of adenoid tissue, and frequently this is markedly aggravated by a chronic amygdalitis. I have seen several cases recur, when upon the second operation there was not a vestige of diseased bone in the middle ear cavity, all the trouble being at the lower end of the tube.

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*Read at the 14th annual meeting of the American Laryngological, Rhinological and Otological Society, held at Pittsburg, May 28-30, 1908.

The effect of the operation upon audition is one of, if not the most, important to the patient, and I believe it is not discussed as frankly with the patient about to have this operation, as it should be, for many have volunteered the statement, that, had they known their hearing would be so poor, they would never have had the operation done. I have never seen but one case where the hearing was improved and remained so following operation, nor do I believe in the majority of cases that an improved permanent audition is ever the result of that operation. To be sure, there are a number of cases reported with most brilliant results in regard to audition, but the reason for this is, no dead bone was present when they were operated upon, and in all probability recovery would have taken place by a more conservative method of treatment, and a greater amount of audition been spared to the patient. In the vast majority of cases at the end of six months or a year, the hearing for all practical purposes, principally that of conversation, is a thing of the past and never returns.

Tinnitus. In a certain number of cases operated upon the tinnitus is improved temporarily, but after a substantial mass of scar tissue has re-formed, it again becomes troublesome, though not as a rule to such an extent as before.

Pain. The pain in nearly every case is relieved after operation.

Vertigo. That which has been caused by pressure and not by labyrinthine disease is invariably relieved, and even though the patient exhibits marked vertigo prior to operation, the labyrinth should not be molested, unless we find a necrotic process invading it.

Nausea and vomiting are relieved in the majority of cases, as well as unsteadiness of gait, unless the labyrinth is involved.

When mental symptoms are present they are greatly relieved, and in the majority of cases give no further trouble, and there is a gradual improvement in the whole system.

Facial Paralysis. This occurs in a number of cases operated upon, but fortunately it is in the majority of cases but transient. It is wise, however, to acquaint a patient about to undergo this operation of the possibility of such an accident taking place. Should the nerve fail to perform its usual function at the end of a month after the operation, the use of an interrupted galvanic current will hasten resolution very materially.

Among the many reasons given why the radical operation should be performed is, that if the disease be allowed to proceed unchecked, there will eventually be an involvement of the opposite ear, non-suppurative in character, or of the nerve. I have seen a few cases of long standing to which no other attributed cause could be assigned to this bilateral invasion. How frequently this occurs, I am unable to say, but think it is oftener than was formerly realized.

The cosmetic results of a Stacke pure and simple are always good, barring accident, such as an infection of the suture line or a perichondritis of the auricle. In fact, it would require close scrutiny to detect a scar in the majority of cases one or two years after the operation was done, and the meatal opening, though larger than normal, is by no means disfiguring. A question which most patients ask prior to operation is, "how long must they be incapacitated from their usual daily routine?". This varies with the individual, much depending upon the general condition at the time of operation. In an average case, they can be up and around at the end of a week, and can, in a measure, resume their usual duties in from four days to a week later, making the time limit they are away from business two weeks. In the average case there is complete dermatization in from six to seven weeks from the time of the operation. A few cases heal completely in from four to five weeks, but this is by no means the average, and is independent of either a primary or secondary graft. In a suitable case the placing of a secondary graft on the operative field does in a few instances hasten rapid dermatization, but it has so seldom been successful in my hands that I have practically abandoned it. In advising this operation for our patients, a most important question should be considered, that of mortality, and it is impossible to gather statistics upon this point, for operators are prone to report successes and not the failures.

That deaths do occur at times following this operation, we who are doing this work all know, and I believe that every one doing a considerable number of these operations could report, if he would, a certain percentage of deaths. If this be true, and I believe it is, should we not then be a little more guarded in our prognosis when the operation is under discussion with the patients or their families? I have had two cases of meningitis, and two of thrombosis of the sigmoid, bulb and vein, following, I believe, as the direct result of this operation, and all were fatal. I have also seen ten cases of meningitis, in consultation, following the operation, all of which were fatal, and six cases of sinus involvement and two of brain abscess of the acute variety. Three of the six sinus cases recovered after evacuation of the sinus and resection of the vein, one of the abscess cases recovered, the other died. I do not wish by the report of these fatalities to be understood as condemning the operation, for I am unqualifiedly in favor of it, when the local conditions and symptoms call for surgical relief, but I do protest against advising this operation, without informing the patient of its gravity.

To state that it is a simple operation, is to say what none of us who are doing this work believe, for I do not know of any more delicate, difficult and tedious work in the whole domain of surgery, than to do this special work as it should be done, and it is for this reason that I believe that no beginner should for a moment think of obtaining his experience in this line first from his patients, but should do as many operations upon the cadaver as he can, as a preliminary step to perfecting himself in the technique of this particular work.

No. 62 West Fifty-second Street.

THE VALUE OF THE DIFFERENTIAL BLOOD COUNT AND OF THE BACTERIOLOGICAL EXAMINATION OF THE AURAL DISCHARGE AS DIAGNOSTIC FACTORS IN CASES OF MASTOID INVOLVEMENT.*

BY EDWARD BRADFORD DENCH, M. D., NEW YORK.

The question as to the value of the differential blood count, and of the bacteriological examination of the aural discharge, as affording a definite factor in the prognosis of cases of suspected mastoiditis, has interested the otologist for a considerable period. From a general surgical standpoint, we would naturally expect that the presence of pus in the mastoid would cause not only an increase in the number of white cells circulating in the blood, but also an increase in the percentage of polymorphonuclear cells. This view was taken by most observers for a number of years after the value of the differential blood count became recognized in general surgical practice.

In 1907, the writer presented a paper before the New York Clinical Society, on the value of the differential blood count and of the bacteriological examination of the aural discharge, as an indication for the mastoid operation. This paper was published in the *New York Medical Journal*, October 12th, 1907.

At the suggestion of our Secretary, I have taken the liberty of bringing this subject to your consideration. The present paper will include the paper already published, together with added observations which have been made during the last twelve months.

Let us consider first the value of the differential blood count in cases of suspected mastoiditis. Referring to my former paper, I reported twenty-four cases, operated on at the New York Eye and Ear Infirmary. In seventeen of these the simple mastoid was performed, in six the radical operation was performed, owing to the fact that acute symptoms occurred in a patient already suffering from a chronic middle ear suppuration. In one case, the mastoid suppuration had involved the cranial cavity, and an epidural abscess was found at the time of operation. The blood count in these twenty-four cases showed that in uncomplicated cases, the highest leucocytosis was 25,200, with a polymorphonuclear count of 64 per cent. In the other cases, the leucocytosis ranged between 6,000 and 20,000, and in no case did the polymorphonuclear count reach 80 per cent, in the uncomplicated cases.

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*Read at the 14th annual meeting of the American Laryngological, Rhinological and Otological Society, held at Pittsburg, May 28-30, 1908.

The later statistics show that in thirty-six cases, in no uncomplicated case, did the polymorphonuclear count rise above 80 per cent. In seven cases, it was below 60 per cent, in eight cases between 60 per cent and 70 per cent, and in thirteen cases between 70 per cent and 80 per cent. In eight cases, following the mastoid operation, in which either some visceral, intracranial complication, or infection of the superficial tissues took place, the polymorphonuclear count was above 80 per cent.

In all of these cases, of the last series, however, in which the polymorphonuclear count was above 80 per cent, the mastoid operation had already been performed, and the polymorphonuclear count was simply indicative of some further complicating lesion.

It is interesting to note, in this connection, that two cases, in which the polymorphonuclear count was above 80 per cent, recovered perfectly after incision of the drum membrane, while in two other cases—one in which the jugular was excised for thrombosis, and in another in which there was a complicating pneumonia, which later required excision of the jugular—the polymorphonuclear count never reached 80 per cent.

Taking up next, the leucocyte count, in eight cases the leucocyte count was below 9,000, in thirteen cases between 9,000 and 12,000, in ten cases between 12,000 and 20,000, and it was above 20,000 in four cases. One of these four cases died of meningitis; the second was a case of simple mastoiditis, in which after operation, the polymorphonuclear percentage suddenly rose to 88 per cent, with a white count of 40,000. The next day, however, the polymorphonuclear count was 74 per cent and the white count 16,100. Both the polymorphonuclear rise and the white blood count were undoubtedly due to some sudden visceral complication. In the third case, the increase in the polymorphonuclear count must be attributed to a similar cause, as two days later the polymorphonuclear count fell to 61.2 per cent, and the white cells to 13,000. In the fourth case, the white blood count was 29,800 in a case of simple mastoiditis; the polymorphonuclear count was only 71.4 per cent in this case.

I have simply given these four cases to show how misleading a single blood count might be.

Referring to the preceding paper, already quoted, it was found that in 24 cases the leucocytosis ranged between 6,000 and 20,000, in uncomplicated cases. In two cases, however, in one of which there was a burrowing abscess of the neck and later a cerebellar abscess, there was a high leucocytosis, of 33,600, with a polymorphonuclear count of 84 per cent. In a second case, one of double mastoiditis, complicated with suppuration of the supraclavicular glands and involvement of the lateral sinus, the leucocyte count at one time was 30,000, while the polymorphonuclear count at times ranged slightly over 80 per cent.

We may say, therefore, that in no single case of this series, did the differential blood count offer the slightest help in diagnosis. In the paper previously mentioned, I called particular attention to a case of acute otitis media, involving both ears; in which the polymorphonuclear percentage was about 84 per cent, while the leucocytosis was 29,000. In this case—that of a rather nervous boy—considerable mastoid tenderness was present. Both ears were draining freely, however, as the result of myringotomy, and the prompt appearance of certain signs in the chest showed that the increased leucocytosis and high polymorphonuclear percentage were due to the thoracic lesion, rather than to mastoid involvement. This patient made a perfect recovery, without any further operation than myringotomy.

When we come to consider the value of bacteriological examination of the aural discharge, as determining the indications for radical interference in cases of middle ear suppuration, we are confronted by the same problem as meets us in the consideration of the differential blood count.

Combining the series of cases reported previously, with those reported at the present time, we have a series of 89 cases. In 11 the discharge was either not examined or the character of the discharge was undetermined; in 10 the discharge was sterile; in 21 the discharge showed streptococcus in pure culture; in 5 pneumococcus; in 1 mixed streptococcus; in 7 mixed infection; in 10 staphylococcus; in 13 streptococcus capsulatus; in 3 pneumococcus and streptococcus; in 3 latent streptococcus; in 3 pneumococcus and staphylococcus, and in 2 colon bacillus. Out of these 89 cases, 44 came to either mastoid or radical operation. Of the series of 37 cases, previously reported, 7 came to mastoid operation. In two of these, the infection was mixed streptococcus and pneumococcus. In one the discharge was not examined. In one the infection was staphylococcus, in two streptococcus capsulatus, and in one mixed infection with streptococcus.

Of the present series of 36 cases, in 23 the mastoid operation was performed; in 11 of these there was streptococcus infection, in 3 infection of staphylococcus, in 4 the infection was mixed, in 1 case the examination was unsatisfactory. Four cases were submitted to the radical operation. No culture was made in 3 of these cases, and in 1 case the infection was recorded as "mixed infection." Of the 9 cases in which the mastoid operation was unnecessary, no culture was made in one case. Streptococcus infection was present in 4 cases, streptococcus and staphylococcus in 1, mixed infection in 2, and pneumococcus and streptococcus in 1.

Looking over the cases of mastoid operation, we find that streptococcus infection predominated in both series of cases. This would naturally lead us to expect that, given a streptococcus infection, the chances of probable mastoid involvement would be greater than where the infection was due to some other organism. As in a number of these cases, however, the infection was of a milder nature, this rule cannot be laid down as an invariable one. It should also be noted that in 9 cases in which no operation other than free incision of the drum membrane was performed, streptococcus infection was present in 4 of these cases. It is wise, therefore, for the surgeon to bear in mind simply, that given a streptococcus infection, the possibility of serious mastoid involvement is greatly increased; that such involvement, however, is certain in a doubtful case, cannot be decided upon the evidence of bacteriological examination alone. Some of the classical symptoms, indicative of mastoid involvement, must be present before, even in a doubtful case, the mastoid operation should be advised.

Much attention has been drawn recently to the virulency of streptococcus capsulatus infection. In the series of cases reported in the article already alluded to, streptococcus capsulatus was present in 10 cases, and in only two of these was the mastoid operation necessary. In the last series of cases reported, streptococcus capsulatus infection was present in three cases. Two of these cases recovered perfectly after incision of the drum membrane, while in one case a mastoid operation was necessary, followed later by the radical operation, with opening of the labyrinth.

While this communication involves such numberless figures that it may be confusing to follow it, several important points are, I believe, clearly demonstrated: First, that in no single case of simple mastoid involvement was the increased leucocytosis or the increased percentage of polymorphonuclear cells sufficient to aid the surgeon, in any way, as to the probability of mastoid involvement, second, that while a streptococcus infection of the middle ear is, without doubt, more serious in character than some of the other infections, many of these cases recover after free drainage of the middle ear has been established by a competent incision through the drum membrane; third, that while the streptococcus capsulatus infection is undoubtedly severe and insidious in character, and gives rise to few general symptoms, the frequency with which this infection can be overcome by free incision of the drum membrane is easily demonstrated by the above statistics, namely, that out of 13 cases in which streptococcus capsulatus infection was present, in only three of these was the mastoid operation necessary. I might add that all of these 13 cases occurred in private practice, and that the patients have been under personal observation for periods varying from 3 to 18 months, so that the possibility of any unrecognized extension, due to infection, is absolutely impossible.

It would seem that the involvement of the soft tissues, either of the neck, the brain substance itself, or of the lateral sinus, would be indicated by a rapid rise in the polymorphonuclear percentage, together with an increased leucocytosis.

Quoting again from my previous article, in two cases of otitic meningitis, in neither of these cases, excepting just before death, did the blood count give the slightest hint as to the involvement of the intracranial structures. In a case of cerebral abscess, previously recorded, and in one case of sinus thrombosis, also previously alluded to, an increase in the polymorphonuclear percentage, together with an increase in the number of leucocytes present, was of aid to the surgeon. I believe, therefore, that we may safely say that an increased polymorphonuclear percentage and an increase in the leucocyte count, is of absolutely no value in determining the presence of pus in the mastoid in doubtful cases;—that where these variations from the normal blood count occur in aural cases, we must look for one of three conditions: 1st, some visceral lesion; 2nd, some involvement of the soft tissues in the immediate vicinity of the wound, and, 3rd, for some involvement of the intracranial structures, either of the brain substance or of the lateral sinus. It should be particularly borne in mind, as is clearly demonstrated by the statistics, that in certain instances, a thrombosis of the lateral sinus may occur, in which the polymorphonuclear count will not rise above 80 per cent, and in which the leucocytosis will not be greatly increased. The differential blood count and bacteriological examination of the aural discharge is certainly indicated in every case of middle ear suppuration, although the actual amount of information afforded to the surgeon is certainly problematical. The surgeon must still rely on clinical signs of involvement of the mastoid and of the intracranial structures, and must put the bacteriological examination of the discharge and the differential blood count in a secondary place, in arriving at his diagnosis.

No. 17 West 46th Street.

Effects of Faulty Eye, Ear, Nose and Throat Conditions upon the Mental Development of School Children. HERBERT F. TRUE. *Southern California Practitioner*, September, 1908.

The author remarks that a child whose faculties are dulled by affections of the special senses is not only held back in his studies, but that "once he realizes that he is unable to cope with his tasks, as do his fellows, his spirit for the attainment of perfection and the approval of his elders wanes, and his interest goes elsewhere, usually to worse things or trivial matters." Sometimes he flees from the place of his torment, the school room.

In the examination of 5,321 school children in Los Angeles, 2,241, or 61 per cent., were found defective in eyesight; 1,170, or 22 per cent., defective in hearing; 1835, or 31 per cent., had adenoids; 1,390, or 25 per cent., had enlarged tonsils.

Dr. True remarks that "of fifty bright pupils and fifty dull pupils selected by six teachers on account of their marked brightness or dullness, eight bright ones were found defective in some condition of the eye, ear, nose or throat; and forty-three of the dull ones had some easily detected and marked defect of these organs. This proportion speaks for itself. *The dull ones are the defective ones, and the defective ones are the dull ones.* EATON.

RHINOSCLEROMA IN NORTH AMERICA.

BY EMIL MAYER, M. D., NEW YORK.

Rhinoscleroma, an unusual affection at least in this country, endemic in Poland, contagious to a degree, may involve the external and internal nose, the pharynx or larynx, or either one with the other of those parts. It is characterized by the presence of Mickulicz cells, as well as by a special bacillus. When the external nose is involved, the deformity is apt to be great, and the cause of great unhappiness, two large masses protruding from the nose covering the upper lip. If within the nose only, the mass is apt to be soft and grayish white, and often attached to the turbinals, and by its presence making the nose bulge outward. In the pharynx destruction follows the infiltration, and the clinical picture is identical to that of syphilis, from which it may be distinguished by the history and by the pathological and bacteriological examination.

In the larynx and trachea stenosis ensues with the accompanying dyspnoea, and tracheotomy may be required. The clinical picture is that of a soft, grayish mass, usually subchordal.

Until recent years the affection was considered incurable, and as the principal discomfort occasioned, except when the larynx or trachea was involved, was either from loss of tissue or redundance thereof, the individual lived or existed for many years. The great benefit following the use of the Roentgen rays, especially in the external variety, or those internal ones that may be reached by the rays, holds out much hope for those unhappy individuals.

Because of its unusual nature, the site involved, its comparative rarity and the impetus given to the treatment by recent additions to our therapy, rhinoscleroma is of special interest to the laryngologist, dermatologist and pathologist, and each one of these presents his findings before his respective society either with or without recording them in the medical journals. In this manner the same case may be reported by all three of the specialists named, or at least two of them may do so, thus making it appear that there are many more cases among us than are here collected.

Careful comparison has been made and personal communication had in order to avoid reduplication, in addition to a thorough search of the literature, and the writer presents herewith a review of the cases of rhinoscleroma recorded in the United States, as also a brief history of three other cases not yet recorded. In presenting these cases those only of undoubted rhinoscleroma verified by pathological and bacteriological examination are considered.

The first case recorded was by Sigmund Pollitzer of New York[1]. This case was presented also by Allen and Jackson[2]. It was that of a female, native of Hungary, aged 54. The nose both externally and internally was involved.

W. Freudenthal[3] presents the history of a male, native of Galicia, aged 45, thirteen years in duration, involving the nose, pharynx and larynx.

E. Danziger[4] reports two cases; one a female, aged 37, born in Austria, two years in the United States; nose only involved; the other, a female, aged 50, born in Austria, nose, soft palate and larynx involved.

M. Toeplitz and H. Kreuder[5] report two cases, both in females, born in Galicia, aged 25 and 27 respectively, the mouth and nose being involved in both cases.

E. L. Kenyon[6] had a case of a male, aged 26, born in Bohemia, seven years in the United States, claiming to have the disease six years. This case was presented before the Chicago Laryngological Society, and is the same case recorded by D. W. Day[7]. (Preliminary Report of the Pathologic Finding in a Case of Rhinoscleroma.)

William S. Gottheil[8] presented a case of a woman, aged 30, born in Russia, occluding the nasal passages and involving the upper jaw, septum and alae nasi.

F. G. Stubbs[9] had a case of rhinoscleroma in a female aged 21, Austrian Poland, four years in the United States, nose and larynx only involved.

M. J. Ballin[10] reports the case of a female, aged 53, Russian Poland, sixteen years in duration, involving the nose and pharynx.

R. G. Perkins[11] speaks of the relation of the bacillus mucosus capsulatus group to rhinoscleroma, and of the various members of the group to one another, and mentions the case of a patient of Dr. W. H. Mavin of Cleveland, Ohio. This case was seen in the spring of 1905, was a male of 35 years, born in Eastern Austria, and had the affection two years before coming to the United States.

Emil Mayer[12] reports the case of a female, aged 16, born in Russian Poland, three years in the United States, the trachea being primarily involved, subsequently the inner portion of the nose only

At the dispensary of Mt. Sinai Hospital I saw a case of rhinoscleroma in a male[13], aged 18 years, the nose only being involved at that time. It was subsequently learned that the larynx became involved, necessitating tracheotomy. This case had made the rounds of the clinics in Boston, Mass., also, and was observed by myself in November, 1907. The writer has briefly recorded another case of a female[14], aged 23, born in Russian Poland, three years in the United States, the pharynx and interior of the nose being involved. This case had all the appearances of specific lesion. Not improving under medication, my assistant, Dr. Ballin, excised a portion of the cicatrized mass and the pathological report proved it to be a rhinoscleroma.

W. Freudenthal[15] reports a case in a female, aged nine years. This case, not being previously recorded, is here presented in brief by the courtesy of Dr. Freudenthal, as follows: Patient had had typhoid fever three years before, and has had pain in the nose and headache for the past year. Status on October 20th, 1907: Hypertrophy of left inferior turbinal; this was partly removed and specimen sent to Dr. Jonathan Wright. Patient still breathes with difficulty and submucous resection of the thickened (deviated?) septum was tried. It was found to be impossible to remove the mucous membrane from the cartilage, and resection had to be given up. But another piece of the left inferior turbinal was removed and referred to Dr. Strauss for examination. Both reports agreed that the case was one of rhinoscleroma. The left ala nasi and its vicinity had always felt hard to the touch. Dr. Stern tried the X-rays four times at Mt. Sinai Hospital, but the mother did not care to continue the treatment. Dr. Freudenthal tried radium for at least fifteen sessions, each of which lasted twenty to thirty minutes. Of late he tried the emulsion of lactic acid bacteria, so highly spoken of by Curtis, but in spite of everything the masses grow steadily larger. so that the left nose is entirely occluded now (June 22nd, 1908).

Stanton Friedberg[16] presented to the Chicago Medical Society in May, 1908, the history of a female, aged 21, married, born in Austrian Poland, two years in the United States. The larynx and the nose are principally involved. A complete history of this interesting case will undoubtedly be presented by Dr. Friedberg in due course.

The total number of undoubted cases of the affection occurring in the United States was sixteen; of these thirteen were females and three males; the youngest patient was nine years old, and the oldest fifty-four years; average age was thirty years. Of this number the nose only was involved in four cases, the nose, pharynx and larynx in two cases, the nose and larynx in four cases, and the nose and pharynx in six cases. In all of the cases the affection had its beginning before the patients came to this country, all came from some part of Poland, and no authentic cases originating in the United States have been found.

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25 East Seventy-Seventh Street.

The Surgical Treatment of Otogenic Meningitis. G. ALEXANDER. *Deutsche Medicinische Wochenschrift*, Sept. 28, 1905.

Briefly stated, the surgical treatment of otogenic meningitis at Politzer's clinic consists of the following procedures:—The radical surgical treatment of the suppuration of the ear, exposing the dura, opening and draining the subdural space, aspirating through the opening in the dura, lumbar puncture repeated if necessary, and drainage by means of a counter opening in the posterior cranial fossa. YANKAUER.

PRIMARY SARCOMA OF THE NASO-PHARYNX. REPORT OF CASE.*

BY JAMES F. MC CAW, M. D., WATERTOWN, N. Y.

The case which I present for your consideration was seen January 21, 1907. The following history was obtained.—J. W. M., aged 60 years, male, of Scotch parentage. Family history negative. Had been addicted to the use of whisky, going on periodical sprees for years. Has always been troubled slightly with "catarrh." For twenty years the hearing of left ear has been markedly impaired. The hearing of the right seemed good, and he noticed no difficulty with it until about one year ago, when it suddenly became impaired. This improved in a few days but hearing never returned to its original condition. These attacks of impaired hearing appeared at frequent intervals, leaving the hearing worse after each. For about six month he has been able to hear only very loud conversation. About the time when his right ear began to trouble him, he noticed slight obstruction of the right nostril, bloody discharge when clearing same, and blood-stained sputum when clearing the throat. This was followed shortly by a feeling of fullness and soreness in the throat, slight pains radiating over the entire right side of head, and torticollis on the corresponding side. All the above symptoms increased gradually in severity, with loss of flesh and strength, and he was finally forced to abandon his employment. Several weeks before I was consulted he developed very severe intermittent pain in the right ear, worse at night, a noticeable difficulty in swallowing, and muffled voice. Examination showed the following: His skin wrinkled and drawn, face bore an anxious look; from a man weighing 195 pounds normally, he weighs now only 160 pounds. Temperature, 99.5 F.; pulse, 96.

There was a crest-shaped deviation of the nasal septum to the right and a small polyp in the middle meatus on the left side. In the naso-phaynx was seen a tumor occupying the upper, posterior, and right lateral wall, involving the right Eustachian eminence. It extended from the upper part of the naso-phaynx down to a point opposite the margin of the soft palate, filling the entire right side of this space and in contact with the soft palate above. The surface of the tumor was smooth and firm to the touch below, the upper part was breaking down and undergoing necrotic changes.

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*Read at the meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., September 26-28, 1907.

This necrotic surface was covered with a foul, bloody discharge. Although nasal obstruction was quite pronounced, neither the nasal chambers nor soft palate were involved in the growth, the obstruction being due to the presence of the mass in the naso-pharynx. There was a muffled voice with nasal intonation and slight dysphagia. Based upon the classical symptoms, of the presence of a friable necrotic growth in the naso-phayngeal space, nasal and post-nasal bleeding, severe pain in the ear and head on the corresponding side, stiffness in the muscles of the neck, foul post-nasal discharge and well marked cachexia, a clinical diagnosis of malignancy was made and a piece of the growth removed with forceps for microscopical examination. The pathologist's report revealed the fact that it was a round-cell sarcoma.

The question of diagnosis settled, treatment presented a most perplexing problem. Here was a tumor which had in two weeks from the time I first saw it continued to grow so rapidly that it now completely filled the post-nasal space, forcing the soft palate well forward and downward, producing difficult and painful deglutition, some obstruction to breathing, quite severe hemorrhages from the nose and throat upon the slightest provocation, interference with rotation of the head and motion of the lower jaw, and pain so severe that large doses of morphine were required for relief. At this time the family and patient were willing to have anything done that offered hope of relief from his suffering. The patient was taken to the City Hospital, and after the ordinary preparation chloroform was administered and a low tracheotomy done, a tube introduced and the chloroform continued through this. A mouth gag was now inserted, and with the patient in Trendelenburg position the soft palate was divided in the median line up to the bony portion. The flaps were retracted, when the tumor, about the size of an ordinary lemon, could be plainly seen occupying the situation above described. This was removed as thoroughly as possible with forceps, scissors and curettes, but not to my satisfaction. It was found that there was no definite outline or capsule, but a diffuse growth infiltrating the deep tissues of the posterior and right lateral walls of the phaynx. It was plainly evident that I did not and could not cut wide of the diseased area without injuring important structures. The hemorrhage being also very severe, I desisted from further interference. After checking the bleeding with iodoform gauze packing, the palate wound was closed with interrupted sutures. The gauze packing was removed in twenty-four hours, the tracheal tube on the third day and the sutures from the palate on the fifth day.

In three weeks the patient left the hospital with the tracheal wound closed, great relief from suffering and dysphagia; nasal respiration free and voice clear. Post-nasal examination showed a small nodule just below the Eustachian tube. As the tumor was again increasing rapidly in size I attempted removing with forceps small pieces of the growth every second day as suggested by Bosworth. This proved inefficient, and daily injections into the mass, of fifteen minims of adrenalin chloride (1-1000), were resorted to. Immediate relief of pain followed each injection and lasted from one to two hours. The effect was almost instantaneous, and thus far the writer has been unable to explain this phenomenon satisfactorily. This seemed to hold the growth in check more effectually than anything I had previously tried, but had to be discontinued on account of the rapid heart action and extreme dizziness which followed each injection.

May 23rd some enlargement of the cervical glands on the right side was detected for the first time, with pain and lachrymation of the right eye. The growth continued to enlarge rapidly, and the pain became so intense that on June 23rd the external carotid artery was ligated just above the bifurcation on each side. The superior thyroids were ligated separately. At this time the greater part of the growth was curetted away. Immediately after ligation of the external carotids, palpation of the tumor imparted a very soft, almost cystic feel. This was evidently due to the impeded arterial circulation to the part with more or less collapse of the distended vessels, the venous side being still full. Following this procedure, the patient reacted nicely, the mucous membrane of the pharynx and naso-pharynx became very pale, there was immediate relief from the severe pain, torticollis and muffled voice. A very peculiar phenomenon was the fact that for three days following the operation the patient was unable to swallow liquids but could take solids more easily. The wounds healed by primary union, and the patient made an uneventful recovery, leaving the hospital seven days later. Weight, 128 pounds.

For two months he improved rapidly, gaining twelve pounds in weight, with complete relief from pain and discomfort of any kind, and all hemorrhage and foul discharge ceased. Pulsation in the facial or temporal arteries could not be detected.

About this time the growth again began rapidly to increase in size, extending down the posterior and right lateral walls of the pharynx, crowding the soft palate well forward, interfering somewhat with deglutition, and pain again became quite severe. At this writing the case seems beyond hope of doing anything more except relieving his suffering with opiates.

The pathological report is as follows:—

"*Character of Specimen*:—Neoplasm from naso-pharynx, soft, friable, of grayish-brown color.

"*Miscroscopic Appearance.*—Slides show very little stroma, but a nearly homogenous mass of round cells of connective tissue type with blood vessels among them, the cells being so deeply infiltrating and degenerated as to make the cutting of sections showing single layers of cells practically impossible. A few areas of spindle-shaped cells show and some very large cells, almost simulating squamous cell carcinoma; however, the lack of stroma, position of blood vessels and great preponderance of small round cells seems to warrant the diagnosis of *small round cell sarcoma*. I. M. MEADER."

Notwithstanding the number of cases of malignant disease reported, with the infinite variety of methods used in their treatment, we are still far from the goal of our ambition in dealing with this most horrible condition. True it is we have made *some* advance in the treatment of this disease, but the results in general leave much to be desired. The general subject of malignancy should be of interest to us as physicians, and as laryngologists we should be specially interested in the subject of malignant disease of the upper respiratory tract. There is no subject in the domain of medicine of such importance, about which we know so little. Primary sarcoma of the naso-pharynx is a rare condition. In reviewing the literature of the subject the writer has been able to collect only twenty-three undoubted cases of this disease, including the case herein reported. It might be mentioned that there are many reported cases of sarcoma of the tonsils and nasal passages and a few of the soft palate, involving the pharynx and post-nasal space secondarily, but manifestly these could not be included in this paper as the writer is reporting only sarcoma affecting the naso-pharynx primarily.

In looking up the literature of the subject the author has been impressed with the lack of exact data, in many reports, making it almost impossible to classify the case as to its primary origin or pathological nature. The writer would therefore emphasize the importance of more specific reports as to the nature and primary location of growths in this region, that our literature of the subject may be of more value. A brief review of reported cases is convincing evidence of the necessity for it.

Treatment opens a wide field for discussion. The writer will, however, allude only to those methods which have been found to be of value in dealing with this most dreadful malady. The injection of different substances into the tumor and into other parts of the body has of recent years been practiced quite widely in inoperable cases. Of these substances arsenic, formalin, alcohol, adrenalin, trypsin and amylopsin and the mixed toxins (Coley) have been most used, and all have their advocates. So far as we have been able to find, Thompson of Cincinnati is the only one reporting a cure of sarcoma of the naso-pharynx by any of the above-named injections. He used formalin. In view of the fact that his case was under observation only from April, 1899, to July, 1900, we should feel somewhat skeptical as to the ultimate result. It has been shown over and over again that malignant disease may recur or form metastatic deposits years after the disappearance of the original growth. Chevalier Jackson reports a case with recurrence seven years after laryngectomy for carcinoma, and cites another where recurrence took place thirteen years after removal. From his experience he concludes there is no such thing as absolute cure of malignancy. Trypsin and amylopsin have recently attracted much attention: while it is true trypsin may dissolve cancer cells and some patients improve under its hypodermic use, no cure has yet been reported, and the question of its beneficial action is still to be determined. Arsenic, alcohol and adrenalin have proven of some value in relieving suffering, but without any claim of curative effect. The Finsen Light and X-ray are still under trial, with all probabilities against their general usefulness. Their curative influence we think has been greatly overestimated. The advantage of the Roentgen ray being only in the fact that it exerts a beneficial analgesic effect and causes a diminution of offensive discharge, therefore it is best used after excision of the growth. With our present knowledge of malignant disease, surgery in some form seems to offer the greatest hope of success. The methods usually practiced are: (a) removal piecemeal at different sittings, (b) removal en masse, (c) ligation of the external carotid on each side, (d) ligation and excision of the external carotids, and (e) radical external mutilating resections.

So far as the writer is aware, Bosworth is the only one reporting an absolute cure with any of the above methods; he removed small pieces of the growth every second day and finally succeeded in preventing a recurrence. This subsidence of growth extended over a period of seven years. It seems difficult to account for the discrepancy in results obtained from the use of the same method in different hands. For example, the writer tried the method in his case by which Bosworth obtained such an excellent result, and it proved entirely inefficient and was abandoned.

It would seem, therefore, that there is something aside from the method employed that influences the result, and that something must be inherent in the growth itself, in the individual, or possibly both. Our present knowledge of the cause and nature of malignant disease is entirely inadequate to definitely explain these discrepancies. May we not have different degrees of malignancy inherent in growths, pathologically of the same type,—the same, for example, as we have different degrees of virulency in typhoid fever, diphtheria and many other conditions? This, together with the variable resisting power of different individuals, would theoretically, at least, account for the cases of reported cures of malignant disease. The whole question of malignancy is still so indefinite that we are unable to tell the length of time that must elapse before a recurrence or metastases are improbable. Until we have more exact knowledge of these important factors, we think it wise not to report our cases of malignant disease as cured, but as having remained so long without recurrence or metastasis.

On account of the close proximity of important structures to the naso-pharynx, an attempt to remove a malignant infiltrating growth en masse can be nothing more than palliative. By an early recognition and immediate and thorough extirpation we might hope for better results from this method of procedure. We would strongly advocate such a course if the case is seen sufficiently early, but, as we all know, these cases are usually seen too late, at a time when the growth is infiltrating the deeper structures; and under such circumstances it seems to the writer that ligation of the external carotids, either with or without resection, offers the best chance for relief of symptoms and comfort of the patient. The external mutilating operations, with the resultant deformities, as practiced by the general surgeons, are mentioned only to be condemned. There can positively be no hope of cure when a case has reached a stage that would seem to warrant such a procedure, and the relief of the patient can be accomplished by less mutilation and immediate mortality. Following such operations the patients either die on the table or death follows shortly after. In view of these facts, we feel that such operations are unjustifiable.

TUBERCULAR ULCERATION OF THE PETIOLUS REGION OF THE EPIGLOTTIS.*

BY TIMOTHY J. REARDON, M. D., BOSTON.

This condition is very rarely observed alone. After a thorough examination of the literature dealing with tubercular laryngitis, I have been able to find but two references to it, those of M. Schmidt and L. Pollnow. Heinze observed it once at autopsy.

Case.—J. S., Aet. 34. Business man. Family history excellent. Previous history: When a boy of eight, was thrown violently and had his nose fractured. Present History: He called on me for the first time on August 26, 1904. Complained chiefly of cough, night sweats, increasing emaciation, and pain on swallowing and hawking. Had been a mouth-breather for years. His tubercular trouble began about one year previous. His business had been of an exacting and laborious nature.

Physical Examination.—Lungs showed marked infiltration of both apices, with cavity formation in the left. Nose showed marked stenosis of both sides, due to deviation of the septum. Dry pharyngitis. The larynx showed round ulceration about the size of a three-cent piece on the petiolar region of the epiglottis. This was unaccompanied by edema; no ulceration could be seen elsewhere in the larynx. The larynx was pale in color; the ulcer covered with yellow tenacious mucus. No cartilage could be felt with the probe. The voice was strong in character; it caused him, however, some discomfort to speak. Applications of lactic acid (50 per cent solution) were made to the ulcer after curettement.

September 1. The epiglottis appeared slightly swollen.

September 27. The treatment with lactic acid continued and swelling still present, but not marked.

October 10. Again curetted thoroughly, and lactic acid continued.

October 25. Marked edema of epiglottis present for the first time, and slight edema of the aryepiglottic folds.

November 15. Continued treatment with lactic acid. Lungs show increase of process.

Treatment of a palliative character continued for remainder of time patient lived, but no improvement was noted at any time. He died on January 21, 1905. He did not suffer to any marked de-

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*Read at the Fifth Pan-American Medical Congress held in Guatemala City, Guatemala, August 5, 1908.

gree from his laryngeal trouble, the ulcer remaining local and no destruction of the upper segment of the epiglottis occurred.

PATHOLOGY.

Ulceration of other parts of the epiglottis is common, especially of the edges presenting into the oro-pharynx. The superior part of the epiglottis is prone to trauma, particularly when swollen. For this reason it ulcerates rapidly, and its destruction down to the tongue follows.

This type of the disease may assume the form of an epitheliomatous tumor of the epiglottis, as observed by Gougenheim and Cohn. Bertrand asserts that primary tuberculosis of the epiglottis is very rare. He reports three cases of ulceration of the superior edge.

W. Nikitin reports a case of primary nodular tubercular tumor of the epiglottis. It was removed, and on microscopic examination shown to be tubercular. The patient recovered.

Ramsay reports a case in a girl nineteen years old, of swelling and thickening of the epiglottis, accompanied by cough and hoarseness. No bacilli found. Solis Cohen reports a similar case. The negative character of sputum renders them somewhat questionable, yet the clinical picture given is very definite.

Collier reports a case with fissure-like ulceration, and with arytenoids slightly edematous. No microscopic examination was made.

A tumor form of tuberculosis was first described by Avellis as occurring in the larynx, and may appear on the epiglottis, but is more frequent in or near the sinus of Morgagni and is very rare.

Blumenfeld reports two cured cases of seven years' duration. Ewing and Nicoll report similar cases.

Rindfleisch (Lehrbuch d. path. Gewebelehre iv. Aufl. 1875, p. 325) speaks of the tubercular process, beginning about the glands between the acini and finally breaking into the gland and causing a funnel-shaped ulcer. It may be round in shape.

Ulceration on the posterior surface of the epiglottis has been noted by M. Schmidt as a cause of rapid infiltration of the epiglottis. When the latter occurs this form of ulceration should be looked for. Pollnow states that cases do occur with excessive infiltration without any ulceration being visible. An ulceration of the epiglottis can also produce edematous infiltration of the ary-epiglottic folds and mucosa over the arytenoid cartilage.

Heinze says that ulceration of the epiglottis occurs in 55.3 per cent of laryngeal cases. As to the specific location of the ulcer, he found it twenty-one times at or on the base of the laryngeal surface, three times on the side edges and once near the apex. In one, there was destruction of the upper half, accompanied by ulcer of the tongue.

Heinze reports double ulceration of the epiglottis occurring four times on the edge and three times on the apex, with ulceration of the inner surface. He observed bare cartilage twice in ulceration of the epiglottis, once on the apex and once on the edge. He also states that the larynx is affected next in frequency to the intestines in pulmonary tuberculosis.

McKenzie observed in his clinical study of five hundred cases of laryngeal phthisis that edema of the epiglottis was present in one hundred and sixty-five, many of these being in the early stage. The epiglottis was thickened in one hundred and twenty-five and ulceration was present in one hundred and eleven. In one hundred post-mortems, there was thickening of the epiglottis in eighty-one and ulceration in sixty-nine. He gives a very bad prognosis for all forms of tuberculosis of the larynx, only four cases where it was completely arrested.

A primary tubercular perichondritis causing rapid destruction has not been observed.

SYMPTOMATOLOGY.

Objective: Ulceration of the epiglottis occurs much more frequently on the lingual surface than on the laryngeal surface. It is generally superficial in character, but may reach to the cartilage. If the ulcers are numerous and coalesce, there is a large loss of substance, especially when the ulcer is located on the superior edge of the epiglottis. It then has a gnawed or escalloped appearance. Often the ulcer extends from the lingual base on to the epiglottis, causing it to necrose rapidly, leaving a large ulceration, with the remnant of the epiglottis presenting a thickened, excoriated stump.

Ulceration of the petiolar part of the epiglottis may be very mild in character, and remain localized for months (as in the case reported above) without any marked edematous infiltration. This infiltration, however, can be so marked that a diagnosis of an ulceration at this point may be very difficult, owing to the turban-like shape of the epiglottis, which is often five or six times thicker. This form is a very frequent concomitant of infiltration of the arytenoids due to tubercular disease of the posterior intralaryngeal surface, and also to tubercular disease of the lingual surface of the epiglottis.

Subjective: Dysphagia is the characteristic symptom. Schmidt found this most marked when the ulceration was located on the laryngeal surface and on the outer edges of the epiglottis. When the parts are infiltrated, a sensation of foreign body is present, and the motility of the epiglottis is impeded considerably. This gives rise to the possibility of swallowing the wrong way, which produces spasms of coughing. It also hinders tone production to a marked degree. It may exist without any symptoms. The objective symptoms are more marked in the late stages.

The early stage is apt to be overlooked, and very slight attention is given to ulceration of any kind on the under side of the epiglottis, principally because the swelling prevents a good view being obtained of the laryngeal surface with the mirror.

As mentioned in the case reported here, the ulceration began about the petiolus and remained local for two months before any marked edema occurred. It was only in the late stages that the aryepiglottic folds and arytenoids were involved. No ulceration existed elsewhere in the larynx at the beginning. In the last months of the disease the epiglottis showed some superficial ulceration.

TREATMENT.

Heryng says he curetted the under side of the epiglottis for tuberculosis, but that it is very difficult because of its mobility. Schech and Pollnow agree with Heryng on this great difficulty. Many instruments have been devised for assisting in operations about the epiglottis. Most of these are useless because they are so complicated in their design. To-day, better means can be used for steadying the epiglottis than were obtainable ten years ago. The Kirstein autoscope is especially valuable for this purpose. The laryngeal sound designed by von Eicken for hypopharyngeal examination is also a very good aid.

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No. 76 Commonwealth avenue.

IMPROVEMENT OF TECHNIQUE IN VARIOUS SINUS AND MASTOID OPERATIONS.

BY J. R. FLETCHER, M. D., CHICAGO.

There are serious objections to the present technique in several of the frequently performed sinus and mastoid operations: namely, the Killian radical frontal sinus, the Luc-Caldwell and Krause antrum, and mastoid operations which involve the laying bare of the membranous wall of the sigmoid sinus and the dura of the middle and posterior fossae; also the sphenoid operation.

In the Killian operation the danger of fracture of the bridge, the delay and difficulty in removal of the anterior, and especially the inferior wall of the sinus, and the inconvenience of removal of the frequently present septa, constitute the important objecions.

In the Luc-Caldwell operation there is danger of injury to the roots of the teeth and fracture of the processus alveolaris when the chisel is used; danger to the tooth-roots and delay in widening the original opening with the trephine or any instrument cutting from without inward, as well as lack of control in removing the desired portion of the lateral nasal wall.

In operating in the region of the mastoid we must remember the glass-like brittleness of the inner lamella of the skull and the danger, in consequence, of rupture of the dura or membranous wall of the sigmoid sinus when they are to be laid bare.

In making the initial opening in all of these operations, the dangers either do not exist or are minimized, therefore the means now used seem to be admirable. It is in the enlargement of the opening that the difficulty comes.

The present means of opening the sphenoid sinus leaves much to be desired, because of the slowness of operating and the remaining raggedness of the wound.

To obviate these difficulties I have constructed an instrument on the principle of the punch and die, which cuts in all directions without change of position of the hand.

It is composed of a mushroom-shaped head (the punch) and a ring knife (the die) which are connected to the grip by parallel shafts. The head is sharp on the margin of the under excavated portion of the hemisphere, and is of one piece with the shaft, which connects it to the fixed handle of the grip. The ring knife, through which the head passes, in the act of cutting, is connected, by means of a moving shaft, parallel to that of the head, to the movable handle of the grip. (Figure 1.) It is easily separable for the purpose of cleansing or repair.

The lever device and grip are so constructed that any bone which will engage between the head and the ring can be cut with comparatively little pressure, the cut portions passing out automatically through the enlarged posterior opening of the ring. A perfectly smooth cut of both the soft and bony tissue is made. When the head is passed through an opening made with a trochar the initial cut is circular, the following cuts semicircular. As this instrument cuts in all directions, a circle, square, or triangle may be made around as large an area as is desirable, allowing the central piece to fall out.

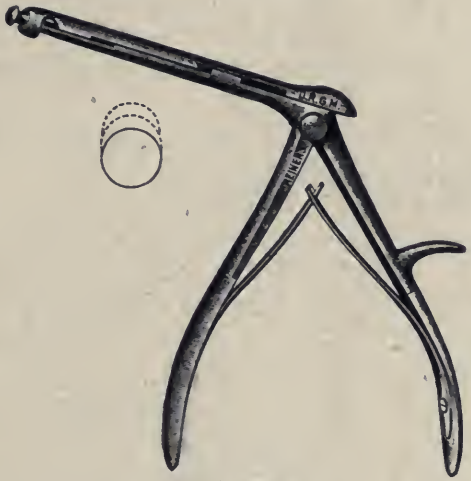

Figure 1.

I wish to emphasize the convenience and rapidity with which one may cut with this instrument without change of position of the hand. No contortion is necessary to reach any desired situation.

Figure 2 is the same cutting device with the Hagedorn needle-holder handle which so many operators find most agreeable to work with.

Figure 3 is a modification for the Krause operation. Its advantages are that it cuts forward, backward, upward and downward, leaving the margins of the wound perfectly smooth; the latter being especially desirable in this operation, as otherwise the pus flowing over the ragged portions causes rapid formation of granulation tissue and closure or occlusion of the opening.

When this instrument is used for the Krause, the lateral nasal wall should be punctured with a trochar, but not further broken down, as pieces of fractured bone, held between membrane, may be forced into the cavity and lie unnoticed on its floor, later to be lifted up by secretions and thus spoil the operation. If the walls are not rigid, it is difficult to make cut after cut, in quick succession, with any instrument, especially with this one. If the wall is firm and upright, the neck of the instrument quickly finds the deepest part of the last hemispherical cut.

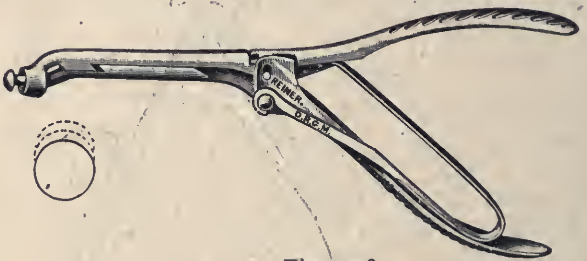

Figure 2.

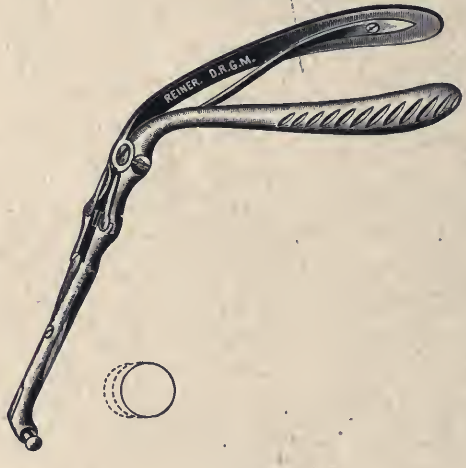

Figure 3.

A fourth model, for the removal of the anterior wall of the sphenoid cavity, differs from figure 1 only in being smaller and the shafts longer.

After making an opening, as advised by Hajek, with his hook knife, I have removed the entire anterior sphenoid cavity wall of one side, in the living subject, in less than one minute, leaving the margins perfectly smooth.

In conclusion, I wish to thank Mr. H. Reiner, of Vienna, by whom these instruments are made, for his skill and accuracy in following my directions. They were constructed during the time of my studies there.

A CASE OF OSTEO-CHONDROMA OF THE SEPTUM WITH EXTENSIVE ABSORPTION OF THE CRIBRIFORM PLATE; TUMOR EXTRUDING INTO THE CRANIAL CAVITY, SPHENOIDAL AND ETHMOIDAL CELLS.*

BY ROBERT C. MYLES, M. D., NEW YORK CITY.

Mr. J. C. had an operation performed on his nose ten years ago. Three years afterward his nose began to be obstructed and he consulted a physician, who made a diagnosis of a large bony growth situated very deep in the nose. Mr. C. then consulted another physician, who operated by boring through the nose. This was followed by some relief. In February, 1907, the patient consulted Doctor C., who diagnosed a large bony tumor back of the nose, and advised a radical operation. Patient consulted Dr. Myles at the New York Polyclinic, April 27, 1907. Diagnosis was made of a very hard tumor, probably an osteoma, involving the posterior part of the septum, and extending into the spheno-ethmoidal region.

A radical external operation was advised, but patient declined and was not seen again until January 8, 1908, when he consented. Diagnosis was changed to probable osteo-sarcoma, as it had more than doubled in size during the past eight months, and because a trocar was driven into it with moderate taps with the hammer.

The operation was performed under cocaine, morphine and hyoscyamin anesthesia by Dr. John A. Bodine and the writer, January 18, 1908. After one external carotid artery had been tied and a temporary ligature placed around the other, an incision was made transversely through the nose close to the inferior borders of the nasal bones extending through the alae-nasi and the quadrangular cartilage down to the level of the face. This allowed the tip of the nose to drop down on the upper lip. The incision was then continued along the line of the articulation of the nasal bone and the nasal process of the superior maxillary as far as the frontal bone and thence across the nose along the articulation between the nasal bones and the frontal bone. Then the nasal bone was separated from the superior maxillary with a heavy pair of cutting forceps, and from the frontal bone with a chisel and mallet. The patient at this juncture protested, manifesting symptoms of some distress and pain.

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*Presented before the Section on Laryngology and Rhinology of the New York Academy of Medicine, February 25, 1908.

The bridge of the nose was broken loose, laid over on the left side, and a large tumor was seen filling the greater part of the nasal cavities and accessory sinuses. The macroscopical appearances were those of sarcoma, especially to our minds, which were already biased in favor of that diagnosis.

After Dr. Bodine had removed a part of the tumor he requested me to remove the deeper parts, which I did, aided by a headlight and instruments especially adapted for intra-nasal procedures. Prolongations of the tumor had extended into the sphenoidal and ethmoidal cells and the orbital and cranial cavities. Great care was used not to puncture the phagocytic walls and meningeal membranes. While I was removing the tumor from the cranial cavity a little chloroform was used. It was noticed that over the area where the cribriform plate was absent there was an intra-cranial pulsation about one-fourth of an inch. Microscopical examination of the specimen proved it to be a chondroma. This diagnosis was made by Dr. Jeffries and corroborated by Dr. Jonathan Wright. I present a slide for your examination and a six-ounce bottle filled with only a part of the tumor which was removed. The patient has made an uneventful recovery under the careful attention of my assistant, Dr. Augustus M. Anderson.

46 West Thirty-eighth Street.

Otosclerosis in a Cat. L. KATZ. *Archiv f. Ohrenheilkunde*, May; 1906.

The author examined the internal ear of a cat 23 years old which had gradually become deaf during the last years of its life. He found a rarifying ostitis of the bone surrounding the labyrinth, with partial degeneration and atrophy of the cochlear nerve and of the organ of Corti. There was no ankylosis of the stapes, the entire annular ligament being intact.

The article concludes with a review of the pathology of otosclerosis in the human being. YANKAUER.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting October 28, 1908.

Report of Cases Treated by Means of the Author's Combined Bridge and Intra-Nasal Splint for the Correction of Depressed Fractures and Deformities of the Nose. W. W. CARTER, M.D.

Mr. Chairman and Gentlemen: I have the pleasure of presenting these cases from Drs. Knight and Smith's clinic at the Manhattan Eye, Ear and Throat Hospital.

The first patient is an amateur athlete and pugilist, 21 years of age. Family and personal history unimportant.

While jockeying in a race three years ago, he fell from his horse, and striking on his nose, he fractured it. Following this injury, his nose was flat and he was unable to get the slightest amount of air through it; on account of this he gave up boxing.

Examination showed a broad, flat nose. Both nasal cavities were obstructed by a very thick septum. On January 23rd I did a submucous resection of the septum, relieving the nasal obstruction. On examining the patient under ether five days later, I found the nasal bones to override the nasal processes of the superior maxillae and the lateral cartilages to be displaced backward at their junction with the lower edges of the nasal bones.

After thoroughly mobilizing the nasal tissues according to the method advised by Berens, and separating the lower ends of the nasal bones from the lateral cartilage with a Miles rectangular septal knife, I applied the bridge and splints. The apparatus was removed in eight days.

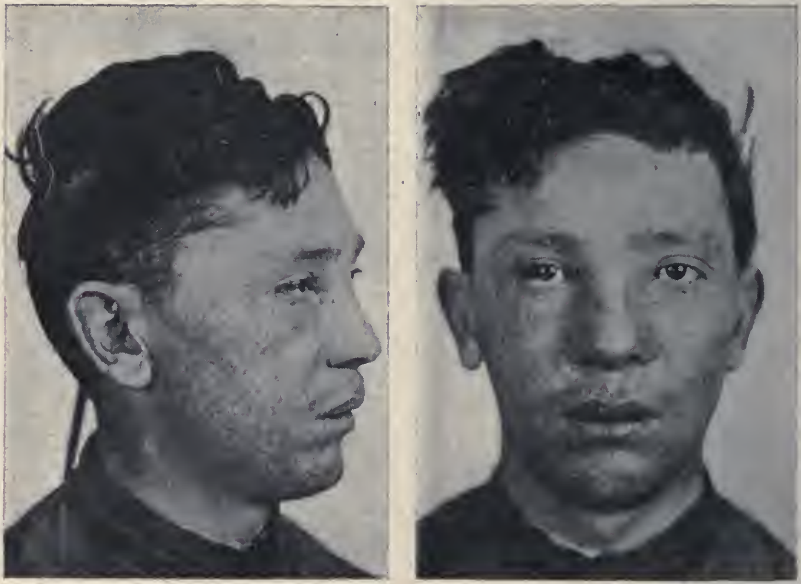
You will note that the nasal cavities are clear, and that the contour of the nose is fairly good.

The second patient is a man 24 years of age, of good family history. He has never had any serious illness, and denies venereal disease. He has suffered with atrophic rhinitis in its most severe form since early childhood.

Examination showed a broad, flat nose almost on a level with his cheeks. The nasal chambers were very roomy, and were covered with crusts.

He was treated with daily irrigations of saline solution and massage, with 25 per cent argyrol solution three times a week for six months. Both the local and general conditions having greatly improved under this treatment, in March I raised the bridge, lengthened the septum and modified the size and shape of the nostrils in the manner previously described before this section as shown in the drawings.

In this case the nasal bones had completely disappeared, and I chipped off pieces of the nasal processes of the superior maxillae and used them in building up the arch. The case progressed satisfactorily, and the splints were removed in ten days. ,



First Case, After Operation.

Case I. (Dr. Carter) Patient after operation. (Negatives showing patient before operation were accidently destroyed.)

A small perforation resulted from the septal operation; this was due to the extreme tenuity and poorly nourished condition of the septal tissues.

The patient has been greatly relieved by the narrowing of the nasal chambers and the consequent improvement in his atrophic rhinitis. The shape of the nose is much better, the arch being higher and the nostrils narrower and more shapely than before the operation. We may reasonably assume that these improvements are permanent, as eight months have elapsed since the operation.

The third case demonstrates the usefulness of the instrument in recent fractures of the nose. In this class of cases especially there has long been felt the need for an instrument that will immobilize the parts in their normal position until union has occurred.

This boy, 17 years of age, fell from parallel bars in a gymnasium on September 5th, and struck on his nose, fracturing it.

Examination showed the nose to be badly swollen, discolored, and a ragged cut extending across the bridge through which the nasal bones could be felt with a probe. The nasal chambers were completely obstructed. Two days after the injury the patient was etherized, the nasal bones, which were broken and protruding into the nasal chambers, were placed in position, and the bridge and splints applied. The ease with which the parts were pulled into their proper relations was a demonstration of the correct mechanics of the apparatus to those present. The instrument remained in position for a week, when it was removed. The result, you will see, is as nearly perfect as possible, both as to contour of nose and integrity of nasal chambers. In fact, the boy tells me that he can breathe through his nose much better than before the injury.

The fourth case is this boy, who is 14 years of age; he had his nose broken in a fight last May.

Examination showed the nose to be flattened, a step-like depression at the point of junction of the nasal bones with the lateral cartilages and considerable over-riding of the nasal bones over the nasal processes of the superior maxillae, especially on the left side, where there was a very large bony protuberance (well shown in the cast.) The nasal chambers were almost obstructed by a thick, irregular septum.

On July 12th I did a submucous resection of the septum; this relieved the stenosis. On October 13th, under ether, I mobilized the nasal bones by first liberating them from the nasal processes of the superior maxillae with a small chisel, working from within the nose, and completed their mobilization with the Adams forceps. (This is the method devised by Dr. Berens.) The dorsum being held down by the septum, I made a diagonal cut through the upper part of the latter, beginning below and emerging on the opposite side near the roof of the nasal chamber. This enabled me to raise the dorsum without leaving a perforation. I did not attempt a sliding flap operation in this case on account of the previous submucous operation. It may be that this diagonal cut in the septum will answer the purpose and prove to be more practical than the more intricate sliding flap operation. I wish here to emphasize the importance of releasing the dorsum from the binding action of the shortened septum, otherwise it cannot be raised.

All the tissues of the nose being perfectly flaccid, the bridge and splints were appplied and the nose pulled into its proper position. The apparatus was worn for eight days.

The result, you will see, is very satisfactory when compared with his previous condition as shown by the plaster cast. The intranasal conditions are equally improved, and no perforation resulted from the septal operations.

I regret that I have not more cases to show to-night, but I feel that these results show the efficiency of this method of treating a class of patients for whom so little has been done in the past, and I trust that a larger experience and improvement in technique will show even better results.

I must apologize for using again drawings that have already been exhibited before this section, but I felt that I could demonstrate the application of the apparatus better in this way than by unaided description.

DISCUSSION.

DR. HARMON SMITH said that he had had the pleasure of watching these cases and thought the mechanical appliance a good one, but that it was especially applicable to recent fractures rather than to long-standing ones. He was still inclined to think that there might be danger of running the suppurative ligature from the inside to the outside, as there was a possibility of infection, though this has not occurred in the cases presented. He did not entirely agree with Dr. Carter in regard to some of the internal operations on the septum, particularly that in the first case, which did not turn out quite as well as it should have done. In recent cases, however, the appliance has proved to be of great advantage.

DR. DOUGLASS said that the apparatus seemed to be something that we have been looking for in such cases for a long time. The difficulty has been to find a splint which would hold up the nose without increasing the lateral pressure. In this splint all the traction was upward, and it certainly would hold the traumatism of the nose in the correct position. He did not quite agree with what Dr. Smith had said about the danger of sepsis from carrying the suture through the nose, as he did not see that there was any more danger here than in ordinary compound fractures, or in cases of submucous operation. It does not seem to be a scientifically accurate mechanical way in which to get at the fracture in the nasal and superior maxillary which one may wish on account of the deformity, nor does it deal with the fracture cases in which the deformity is accompanied by periosteal thickening. In such cases it would not deal correctly with it, but the method seems to be an excellent one.

Dr. McCoy said that he had been operating on a number of these cases, and used the method of packing the nose with strips of gauze into which bismuth subnitrate has been rubbed, using these for splints. While the results have been very good, the suffering of the patient was not inconsiderable, and Dr. Carter's idea seemed to him an improvement and an excellent mechanical one. He would give it a trial as soon as a proper case presented itself.

Dr. MacKenty said that he did not think the danger of infection through the point of pressure was very great, and it might be minimized by placing a small silver plate inside the nose and using silver wire instead of silk. Silver inhibits bacterial activity, and would therefore cause less inflammation about the point of emergence than would silk. The plate would serve to distribute the pressure. He thought the apparatus was better adapted for old cases. Recent fractures when set will stay in place without appliance of any kind, but in the old ones there has always been difficulty in keeping up the nasal bones. He had done a good many chronic cases with few satisfactory results. With this clever appliance of Dr. Carter, he looked forward to much better results in the future.

Dr. Carter said that he appreciated the kind remarks that had been made about the apparatus. He felt that there were defects in it, but these he hoped to remedy by further study of this method of treating depressed deformities. So little has been done for them that something ought to be accomplished. In regard to the danger of infection by running the suture from the inside to the outside of the nose, he felt that this objection was rather theoretical than practical. All fractures of the nose are compound fractures, for when the nose bleeds after an injury, it is a pretty sure sign that the nasal bone or one of the other bones has punctured the mucous membrane; therefore the passage of a suture through the nose cannot be considered a complication. In regard to the chronic cases, he felt that the apparatus was well suited for them, but thorough mobilization of the tissues must be effected before the instrument is applied. The fourth case that he reported was one in which the nasal bones had certainly assumed the position in which they were going to remain during the boy's life, and therefore must be considered an old fracture with deformity. The present position of the bones, and the contour of the nose in this case seem to be all right. He did not claim that the method could do anything for exostoses. In such cases the only thing to do would be to chisel off the superfluous bone through an incision. The point made by Dr. MacKenty in regard to the use of silver wire rather than a silk suture was a good one. Silver keeps its wound pretty clean, but silver wire is not so easily handled as silk, and the tension is not so easily regulated. Dr. Carter has had no trouble whatever with the silk suture, and believes that it is best suited to the conditions. The method is still in its infancy, and he hoped, through improvement in technique and greater experience, to obtain better results with it in the future. He believes this to be the ideal method for the treatment of recent fractures of the nose.

A Case of Cerebral Abscess of Nasal Origin. By W. FREUDENTHAL, M. D.

DR. FREUDENTHAL said that last year he had two cases of cerebral abscess, in both of which the diagnosis was confirmed during operation. Often, however, the diagnosis is difficult. In this case there was great difference of opinion. The patient fell sick after taking a great deal of bad whiskey, and went from one hospital and from one neurologist to another, and almost every one had a different opinion. In the course of his wanderings he visited the Roosevelt, Mount Sinai, and Long Island City Hospitals. He had been declared to have a tumor of the brain, local irritation, lues, etc. Dr. Spitzka finally referred him to Dr. Freudenthal, and when first seen he was quite rational, though he was dizzy. He came to the office with his wife, who had to support him. He gave a history of having had a discharge from the nose which ceased suddenly, and almost immediately a terrific headache set in, from which he still suffers. The pain extended over the region of the right frontal sinus and along the right side of the nose. A great deal of pus was found in the middle meatus. The frontal sinus was syringed and pus obtained. This was sufficient evidence upon which to recommend operative procedures, and this was done the next day. Before the operation the patient's temperature was 101 degrees, pulse 54. Only a few drops of chloroform were required for the narcosis. On opening the frontal sinus, half of it showed white bone, with no mucous membrane, but granulations, and some pus. There was no communication with the other side or with the cerebrum. The ethmoid cells were opened, and some pus found. The patient was bandaged and put to bed, and did very well. The next day he recognized the Doctor, knew his name again, his age, etc., which he did not know the day before, and said he had not felt so well for years. This condition kept up for the next week, and Dr. Freudenthal then left for his vacation, but was so interested in the case that he requested daily reports, which he received from the house surgeon. These were very good, and the surgeon in charge thought it was time to let the wound close. On the 7th of August Dr. Freudenthal received notice—this was a few days after the wound was closed—that the patient's general condition was good, and that he was feeling well and mentally perfectly clear. The following day, however, he received word that the patient was ill, and was suffering from considerable headache limited to the right side, which was tender to percussion. His pain before was limited to the right side of the nose, and later it extended to the left side. The report continued that the patient was stupid and dull, at times irrational and incoherent, never violent; had attacks of dizziness, and remained in bed, as he could not walk on account of vertigo. Saw very well, but recognized objects poorly. This condition kept up for some time.

August 12. His condition for the previous two days had greatly improved, but he still complained of severe right frontal headaches. On August 14th Dr. Freudenthal received a note:—"The directions forwarded by you will be followed closely. The condition remains unchanged, and while there is nothing unusual, he complains that the pain in his nose and head is more severe than previous to operation. His eyes were examined by Dr. Torok, who says that there is a double neuritis, more advanced on the right side, and subacute in character and neither suggestive for or against a cerebral condition."

Finally, another neurologist, Dr. G. P. Jacoby, saw the case. He was of the opinion that the patient had a localized cerebral exudate, due to some vascular disturbance. "I thought that trephining might be undertaken as a preventive measure. This, of course, will not be undertaken during your absence."

This condition kept up until Dr. Freudenthal's return in September. He examined the patient and again found much pus in the nose, and recommended re-opening the frontal sinus, but the family objected, and nothing else could be done excepting syringing the sinus. Since early September he has been under close observation, and it has been noted that when there is a discharge of pus the patient feels better, the temperature goes down, the pulse up. His pulse is low—54 on one occasion. When there was no flow of pus, the temperature was higher, and the patient felt dull.

The patient had no convulsions until October 17, when for the first time in the history of the disease he had an attack of muscular twitching of the right arm and leg, lasting for five minutes, accompanied by unconsciousness and stertorous breathing. This attack repeated itself on October 20th. There was no convulsion, but muscular twitchings.

The question now is: What shall we do with this case? He has refused operation, and has, as we are convinced, an abscess of the brain. This seems evidenced by the fact that every time the flow of pus ceases, the headache sets in with all the concomitant symptoms. Consequently there must be some connection with the brain and frontal sinus or ethmoidal cells. I believe that you all will agree with me that the only salvation for the patient lies in re-opening the frontal sinus.

Case of Sinus Thrombosis. By A. P. VOISLAWSKY, M. D.

This is a case where the temperature continued after the operation on the sinus. This patient has been in Dr. Berens' clinic for two years, and came in with an acute exacerbation on top of the chronic condition. A radical operation was performed, and the sinus uncovered the size of a ten-cent piece. There were some granulations, but after uncovering as far as was thought safe the patient was put to bed. The temperature continued, however, and on the 16th he had a chill, and a second operation had to be performed. The sinus was exposed half way back to the torcular, and it was found that it had collapsed. There was considerable bleeding from the emissary vein when exposed. Gauze was applied at each end of the sinus, and an incision was made. For a moment there was no return flow of blood, but we were unable to get a clot. The blood finally returned both ways. Following the second operation the patient's temperature continued up and down for the next ten days, and he had several chills. Another interesting point was that on the 17th of September his leucocyte count was 30,000, polynuclear 88 percent. From that time on it continued down, and in ten days there was a decrease from 30,000 to 16,000, and the polynuclear dropped to 72 percent. The patient made an uneventful recovery.

Tumor of the Larynx. By A. P. VOISLAWSKY, M. D.

The patient is 29 years of age and was first seen about six weeks ago. At that time it was almost impossible to hear what he said—one could hardly hear any sound at all. At present, as you note, he is readily understood. Some years ago he fell in the water and contracted a severe cold, and at that time lost his voice. Seven years ago, however, he had a specific lesion.

Dr. Voislawsky said that he had been giving the patient a saturated solution of iodide of potassium, beginning with 15 grains, and running it up to 60 grains t.i.d. His bowels then became affected, and it was necessary to cut down the dose. He is now taking 25 grains three times a day. The tumor is reduced to half the former size. Formerly there were multiple papillomata, apparently springing from the true vocal cords, which were pretty well eaten away.

DISCUSSION.

DR. HARMON SMITH said that last year he presented to the section a similar case as "gumma of the larynx." At the time of presentation the gumma had partly disappeared; there was necrosis of the left arytenoid cartilage, which had sloughed out. The induration subsided under potassium iodide, but not until the patient had reached a dosage of 180 grains three times a day. The patient remained in the hospital for some time, when the opposite side of larynx swelled up the same as the first, but this condition did not yield to the same doses of potassium iodide; subsequently granulations sprang up from the original site of the lesion where the arytenoid had sloughed, and these continued to grow until it was necessary to insert a tracheotomy tube. The examination of a large piece of this tissue showed it to be carcinoma. The patient returned home, continued to gain in weight and improve in general appearance. He visited the Manhattan Eye, Ear and Throat Hospital again in August and September. The cancerous growth had then extended to the ary-epiglottic fold and involved the epiglottis. It had completely occluded the lumen of the larynx, although the general health of the patient was good. He mentioned this, as perhaps it might prove a guide for Dr. Voislawsky's case, as it gave the appearance of a gumma of the larynx in its beginning.

Removal of an Obstruction from the Esophagus of a Child by Means of Direct Esophagoscopy. By JOHN MCCOY, M. D.

On May 1st of this year, Master T. C., age three years, was brought to me at the University Bellevue Nose and Throat clinic with the following history:—Six days prior to coming to the clinic, the child, while playing with a box of buttons, placed in the mouth and swallowed a good-sized button. The mother saw the child do this and immediately passed her finger into the child's throat in order if possible to remove the button, but she could not feel any trace of it. It was then noticed that the child was unable to swallow anything whatever, even water being returned as soon as swallowing was attempted. He was then taken to a hospital in Brooklyn and kept there for several days. What measures were there instituted to recover the button I do not know, but on leaving the hospital the child was still unable to swallow. He was then brought to our clinic. He was at that time very pale and rather somnolent. Direct esophagoscopy under anesthesia was suggested to the parents, and they readily consented. He was placed in the hospital and put under ether anesthesia. With the direct laryngoscopic tube the larynx was raised forward and a mass of granulations seen in the first part of the esophagus. In this mass was distinguished a black object which on palpation proved to be the button. The straight forceps were applied, and the button was so firmly imbedded that at the first attempt the forceps slipped off. On the second attempt, however, the button was removed. It was found to be a good-sized coat button. The child was returned to bed in good condition. On the following morning, however, he developed a temperature of 103° F., with signs of consolidation in the right lower and the left upper lobes. This condition continued for four days, and the child succumbed to an ether pneumonia on the fourth day. The case is reported because the method of removal was so eminently satisfactory, and because the contingency of a supervening pneumonia, while remote, is a possibility in these cases.

DISCUSSION.

Dr. Emil Mayer inquired how long the child was under the anesthesia—from the beginning to the removal of the foreign body; and upon being told that the entire time was 15 to 20 minutes, he said that the case was a most interesting and valuable one, and he admired Dr. McCoy's courage in presenting it, for one is more apt to present his happy results than the unfortunate ones. The question of the cause of the death from pneumonia was especially interesting. Was it not a possibility that the soft button contained many of the salivary secretions and also secretions from the esophagus, and the manipulations expressed these out, so that some of the active semi-purulent secretion might have entered the larynx and caused the pneumonia—and not alone the ether? That occurs very frequently with a soft foreign body in the bronchus. The work for the detection of foreign bodies in the esophagus and bronchi is being pursued in a very satisfactory manner. Only this afternoon he had had a patient who alleged that she had swallowed a bone, but nothing could be seen of it, and before she left the office she was convinced that she had swallowed the bone and that it had gone into her stomach, and that she would have no trouble with it. Dr. McCoy was to be congratulated upon his presentation of the case.

Dr. N. L. Wilson said that the unfortunate ending of the case recalled to him one or two cases of foreign body which he had recently had, where the foreign body was removed without the aid of the tube. The criticism had been made that his method was not a scientific way of removing a foreign body, but, if it can be found in this way, it seemed to him that one was justified in removing it without the tube. A child was said to have swallowed a safety pin, and he put his finger in the mouth and found the pin with the point sticking into the esophagus. With a pair of forceps he shoved it down, and then putting his finger on the point he withdrew it. He felt that in a case of this kind he was perfectly justified in doing as he did.

Dr. Freudenthal said that on several occasions he had had to examine the upper part of the esophagus for foreign bodies, and he had used the method advocated by Dr. Mosher, and the instruments which he recommends for the examination of the upper third of the esophagus and the larynx. Not long ago he had a case where a man had swallowed a pin, and went to a physician, who examined him and finally got impatient and pushed the pin down. Dr. Freudenthal had a radiograph taken, which showed the pin in the left side of the larynx. The patient was then put under narcosis and the larynx examined, which was easy, as the man had a thin neck, but nothing could be found in the larynx or esophagus, and the patient breathed so poorly that the examination had to be suspended. The examination was repeated, but with the same negative result. Finally an opening was made from the outside, and the pin was found between the skin and the larynx—i. e. outside of the larynx. It had worked its way or was pushed from the esophagus into that region.

Dr. McCoy said that he had passed his finger into the child's pharynx on the possibility of finding the button, but found no trace of anything. He had used not the esophageal tube but the direct laryngoscopic tube of Jackson—with this the larynx was pushed forward. The first thing he saw was a mass of granulations. The foreign body had been there a week, and all that could be seen was this abundant mass of granulations, and he wondered whether or not he was in the esophagus; then on raising the larynx further forward he was able to see the edge of a black object; on palpating it, it proved to be the button. It was so firmly imbedded that on the first application of the forceps and with pretty good traction the instrument slipped off, and a second attempt was required to remove it. It was possible that in the manipulations some of the secretions had entered the lung,—as suggested by Dr. Mayer,—and helped to excite the pneumonia. However, the child had been practically starved for a week and was in a very weak condition, and consequently more liable to have pneumonia.

Thyroidectomy for Malignant Exophthalmic Goitre. By J. E. MacKenty, M. D.

The patient was an unmarried woman, aged 40. Her attention was first attracted to her condition by the constitutional symptoms of Graves' Disease—tachycardia, muscular weakness, tinnitus, tremor, emanciation, partial deafness and unrest. She came to the Manhattan Eye, Ear and Throat Hospital to have her ears treated for tinnitus. The condition was not at first recognized. The tinnitus was probably due to vascular hypotension induced by thyroidaemia.

After an absence of two months she returned to the hospital with pronounced exophthalmos, as now seen, and with a rapidly enlarging thyroid. The right lobe was twice as large as the left, which can be seen in place. The picture of acute Graves' Disease was then characteristic—tachycardia, nervousness, tremor, exophthalmos and pronounced toxemia. At operation, August 1st, 1908, the right half of the gland was removed and the superior thyroid artery was tied on the left side. Recovery was uneventful. The patient is much improved—all the symptoms are much improved, excepting the exophthalmos, which remains, as is usually the case. The microscopic examination of the removed gland roused the suspicion of malignancy, though a positive opinion could not be given. The patient is shown because she is developing a slight paresis on the left vocal cord. The remaining gland tissue is not enlarging. She is an exemplification of the difficulty of making a diagnosis of malignant goitre at the time of operation. There was nothing at all at the time to suggest the slightest suspicion of malignancy.

else the entire gland would have been removed. The question now is, with the evidence before us, should the patient be again subjected to an operation, or should we wait for more pronounced developments?

Tumor of the Epiglottis. By S. W. THURBER, M. D.

The patient is 26 years of age and has no specific history. The only history obtainable is that three years ago he had a very sore throat which lasted three weeks, and his lungs were so affected that one doctor told him he had phthisis, and another, bronchitis. He now comes for treatment complaining of the feeling of a foreign body or lump at the base of his throat. That is the only symptom he complains of; no pain, and it does not hurt him to eat. He lost 20 pounds three years ago when he was ill, but has not lost since then, and is able to do his work as butler. In the morning he coughs up a dry scab. At the upper extremity of the epiglottis there is an infiltration involving its whole width, running back along the aryteno-epiglottidean fold on the left and extending to the anterior surface of the arytenoid on that side. The diagnosis seems to rest between lupus and tuberculosis, with practically no symptoms of activity at present. He was presented in order to obtain an opinion as to what had best be done. There were no tubercle bacilli in the sputum, and he is not suffering except from this feeling of a foreign body at the base of the tongue.

DR. MAYER said that from the clinical picture the case might easily be called a lupus. The thing to do was to take out a piece and examine it. In all probability it was malignant, but at the same time the diagnosis of lupus is a possibility.

DR. DOUGLASS said that it was a typical picture of lupus.

DR. SMYTH said that some time ago he presented a case before the Section which had a very similar appearance. He was advised to have a section examined, which he did, and it was pronounced to be carcinoma. The man grew rapidly worse, and died in one of the hospitals under Dr. Coffin's care. He had been impressed by the similarity between this case and Dr. Thurber's. Several of the men who saw it thought that it was a case of lupus, and there was no pain or other trouble complained of except exceeding dryness of the throat. The man was apparently perfectly well, but after the removal of the piece he went down very rapidly.

Collateral Edema of the Larynx Due to an Infection of the Lower Pharynx.—Recovery. By M. D. LEDERMAN, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

Further Report of the Progress of Experiments with the Lactic-Acid Bacilli, and Exhibition of Cases. By H. Holbrook Curtis, M. D.

In the *New York Medical Record* of July 11th of this year I reported the results obtained by injecting the nasal cavity with the lactic-acid secreting bacillus, of Massol, which Metchnikoff employed in his experiments upon the nasal tract.

In that paper I reported but seven cases with results which were surprisingly good. I advanced, however, a very guarded statement at that time, and preferred to wait until further experience justified a more positive claim as to the real efficacy of the culture. Today I unhesitatingly claim that it is the best means we have at our command in combating that most distressing disease ozena accompanied by crust formation, and for the topical treatment of suppurative disease of the ethmoid cells and frontal sinuses.

I will show you tonight a typical case of six ozena patients treated with equal success—and a chronic double frontal sinus case which I have relieved by this method. This case is also one of six cases which have shown remarkable results from the culture injections. I exhibit a syringe and catheter used for injection of the naso-frontal duct, a means employed as an adjunct to the ordinary spray application of the culture.

Not only does the culture act on the pathogenic bacilli in the nasal and accessory cavities, but the active solution contains a product which has a pronounced effect upon the vaso-motor system of the nose. Turgescent hypertrophies seem to disappear; oedematous conditions resulting from hay fever subside, and its effect on the swollen membrane in the first stages of a coryza is often very remarkable. These phenomena can hardly be attributed to lactic acid nor to the bacilli themselves, but to some agent in the culture solution, the identification of which has as yet not been determined.

Another case I present is a lady who has been under my care for some years with a chronic suppurative otitis media. The right ear has been the offending member, but the discharge has been controlled by packing the tympanum with a ten percent pyoctannin and boric acid powder whenever it becomes active, which event occurs about once a year. Two weeks ago the left ear, which had been quiescent for several years, suddenly became active and a suppuration with carious odor commenced. I inflated the Eustachian tube and injected through the catheter some culture broth, and dropped the same into the ear. Some pain was complained of shortly after the instillation, but to my surprise the discharge was checked in two applications. I will say, however, that this has not been the result in every case I have experimented on with the bacilli. In antrum cases where injections have been made through the natural orifice, as a rule my results have been unsatisfactory.

If in no other cases than in ozena had one experienced great relief, we might still welcome the product produced by the Lederle Laboratory as of inestimable value.

The laboratory extended to me the privilege of making the clinical investigations of the bacilli, but the widespread interest evoked by the original article which I quoted above has made the classification of data from widely separated observers too arduous a task for any one in active professional work, so in future the statistics from all sources will be compiled by Dr. Charles E. North, of the laboratory staff, who has perfected the bacteriological processes of manufacture and to whom credit for the initial experiment belongs.

Case I. The case of ozena presented the following history: M. T., Aet. 35, has had ozena and crusts for eighteen years He has been treated by several specialists. His home treatment has consisted in snuffing salt solution from a tumbler and removal of the crusts, following this with an antiseptic spray.

On October 6th he was referred to me by Dr. Robert Wheeler, of Brooklyn. I found his nasal mucous membrane excoriated in places and the cavities filled with a grumous mass of detritus, with pus on the surfaces in contact with the walls. His general health was greatly undermined. He suffered from constant nausea, indigestion, progressive emaciation, dizziness, headache, great weakness and inability to apply his mind to his work. A confused feeling at times was relieved by clearing out his nose.

After clearing out his nasal fossae and syringing with normal salt solution, I made a spray application with the lacto bacilli culture. After the first injection there was a marked relief in both nose and throat. After the second injection the purulent character of the postnasal discharge underwent a great change. The hawking and choking entirely stopped, and with the disappearance of the crusts, the purulent discharge has been daily becoming more transparent. After six injections the patient states that he is perfectly comfortable and estimates that his trouble has diminished more than ninety percent.

Case II. Mr. J. F. For eighteen years this patient has had a very profuse discharge of pus from the nasal cavities dropping into the throat, so much so that he was constantly clearing his throat during the night. His sleep was much disturbed.

For the last five years there has been more or less pain over both frontal sinuses. I operated upon the anterior tip of the right middle turbinate and curetted the anterior ethmoid cells two years ago. I was enabled to syringe the sinus by means of the catheter, and relieved the discharge somewhat, but pain continued. During the past winter patient has suffered intensely after mental exertion, and has been unable to leave the house at night.

In June last I cleansed both nostrils and injected both frontal sinuses as well as I could and sprayed the nasal vault with a fresh culture. After the first injection the discharge assumed a very different aspect, becoming thinner and more transparent. After the sixth injection at intervals of two days, the pain and discharge entirely ceased.

A few days ago, after a severe cold, there was some pain and a slight discharge from the left frontal sinus. This, however, was relieved upon the second injection of the bacillus culture. I consider the condition at present to be normal, and the patient considers himself cured.

DISCUSSION.

DR. MYLES said that he wished to congratulate Dr. North on the bacillus, and also Dr. Curtis for the carrying out of this treatment, and to condemn himself for giving Dr. Curtis the opportunity of doing it. When he wrote his paper on Atrophic Rhinitis last spring for the Section he was working with Dr. North trying to find something to destroy the germ. At that time Dr. North suggested this treatment, but Dr. Myles was skeptical on the subject and did not then try it, although he has since used it in a good many cases. He began using it on selected cases at the Polyclinic in June, and his assistant, Dr. Tuggle, has been working with it. Since his own return in the fall he has been using it experimentally in a great many cases. The condition which follows its use is very remarkable in a certain type of purulent, sticky incrustations. It seems to lessen and dissolve them, and patients claim that they can dislodge the crusty secretion as they have never been able to do before. He has seen some cases in which it has not done so well, but it has not yet been tried long enough to know very much about it. He has one patient who uses it every three hours during the day, and another patient with a case of fetid rhinitis in which the odor is decidedly diminished. In some of these cases the crusts have not been removed, but have been left in to see what the acid bacilli would do without assistance. In cases of the milder and younger type the result of this treatment has been very remarkable, and if these good results continue it will be worthy of all the praise that can be given it. Dr. Myles also said that he had an ear case, with a history of discharge for ten years, in which the discharge seemed to come chiefly from the Eustachian tube and drum cavity. Many aurists had seen the case, but it had not been cured. He saw this case first in March, 1908,—and treated it with the usual remedies, without decided relief, until June, when he used the lactic acid bacillus. To his surprise the granulations shrunk and the discharge ceased, but this fall, when Dr. Myles returned, there was the same old story of purulent discharge, and the tube had again filled up. Three treatments were applied, when the discharge again ceased, and has not yet recurred.

These points were not presented as scientific statements, but as simple observations, and he has refrained from putting them on record until he could make a more definite statement of the results obtained. Whether or not the results are produced by Dr. North's bacillus, he is not now prepared to say, but these phenomena have certainly taken place. All occasionally have cases which get well from injections into the sinuses. One injection will sometimes cure them, but he had never previously seen relief from pharyngitis sicca of the posterior nares occur without the continuous use of the usual cleansing treatment.

Dr. L. M. Hurd said that he had begun using the lactic acid bacillus August 1st, 1908, and up to date had had sixteen hospital cases and five private patients upon whom it has been used. Of the sixteen hospital cases, only six continued to attend regularly enough to judge of its effects; two of the six were hay-fever cases, in which it seemed to reduce the sneezing and swelling; all the others were atrophic rhinitis cases, two of which were greatly improved. the crusts and odor disappearing. As they are still using the product, it is at present impossible to tell how permanent the result will be. Of the private patients, one was a case of antrum and ethmoid disease in which the antrum had been opened freely into the nose by removing the lower half of the naso-antral wall. The purulent secretion continued all summer from the ethmoids and roof of the antrum, regardless of antiseptic applications. Three weeks ago the patient was placed upon the lactic acid bacillus culture, applied three times a week, and now she is entirely free from pus, only a slight amount of clear mucus remaining. The four other cases were atrophic rhinitis. These cases were cleansed with douches and started upon the lactic acid bacillus culture alone. One case has been entirely free from crusts, headaches, etc., ever since, and remains so as long as he continues its use, but on discontinuance, about the third day, the old symptoms and crusts began to return. The other three cases did not seem to improve at all.

Dr. Herzig inquired the percentage of the emulsion of the lactic acid producing bacillus employed in ozena as used by Dr. Holbrook Curtis. Also how the emulsion was prepared. Dr. North answered both questions.

Dr. Curtis replied that Dr. North was present, and asked for him the privilege of the floor that he might answer these questions. No other bacteriologist has been able to supply the quantity desired in a given time.

Dr. Emil Mayer inquired whether we have to deal with the living bacilli.

Dr. Lederman wished to know how long one was justified in using the same solution, on account of decomposition, which appears in two or three days if the temperature of its resting place is not low enough.

Dr. North said that the preparation of the bacteria had in many ways found uses and results which were as surprising to him as to those who were using it. When it was first introduced last spring he had published a little paper in which he suggested its use, and hinted that perhaps its effect would be due to the living bacteria contained in the preparation. As time had gone on he was inclined to believe that perhaps the effects are due to the bacterial products rather than to any direct germ action. The bacteria forms are of the type of lactic acid bacillus obtained from milk, described by Metchnikoff, and at first were thought to be identical, but a comparison with other cultures said to be Bacillus vulgaris caused him to hesitate about this. It was cultivated in ordinary broth culture, and can be easily multiplied by simply multiplying the tubes, so that any quantity can be made, provided sufficient notice is given in advance. The bacteria continue to multiply as long as they are fed. Of course the medium contains sugar.

He understood that some of these cases had been previously treated with solutions of pure lactic acid without result and that therefore the results obtained from the use of the culture of living lactic acid bacteria may be due to something besides the lactic acid. The other ingredients of the culture, consisting of beef, etc., may contribute something, and they may also be the cause of some of the effects. One thing that he had not anticipated was the dissolving of the crusts, that had been one of the remarkable results reported. He was unable to account for this. He was also told that it shrinks tissue, and he could not account for that. At the end of three or four days, or perhaps a week, the bacteria cease to multiply and sink to the bottom, leaving the liquid clear.

He could not say how long the preparation retains its virtue, as all that he had sent out had been used up very soon. It might be that it would retain its virtue for a long time, but that question has yet to be determined. The laboratory with which he was connected would be very glad to extend the courtesy of the preparation to any physician who wished to try it.

Dr. Simpson inquired whether any attempt had been made to find out the type of bacteria within the nose that is to be antagonized by the new fluid. It seemed incredible that it should meet all the conditions that can be produced within the nose. Possibly some of the benefits obtained were due to the close attention such cases received on account of a new remedy, as the time has been too short as yet to establish the fact of an absolute cure. In no case as yet reported has sufficient time elapsed to gain a permanent opinion. Several factors may enter into all of these new remedies. Very often the interest taken in them leads the physician and patient to be much more assiduous in the treatment; where a patient was given a douche he might use it or not, but if you give him what you promise will cure him, he will use it a dozen times a day, and so get a mechanical effect. If we are going to cure all these cases of atrophic rhinitis by this new remedy we must conclude that there is but one etiological factor, and unless some laboratory experiments have been made he feared that it might be found that much of this so-called dissolving of the crusts might prove to be simply mechanical results. The treatment, however, is to be welcomed and let us hope that it may prove a great advance toward doing something.

Dr. Hurd said that in reference to the age of the culture, and whether or not that had an effect upon the results, he would like to report an incident. One of his patients, who had obtained brilliant results under this treatment, upon one occasion used an old culture which he had been given, and brought it back saying that it did not work well. He did not know whether or not this was a mere coincidence, but mentioned it for what it was worth.

Dr. Kopetzky was not able to be present at the discussion, but the Secretary read the following report of his results with the lactic acid secreting bacillus:

"Last June, upon the suggestion of Dr. Holbrook Curtis, I began a trial of the lactic acid secreting bacillus, which the Lederle Laboratories placed at my disposal through the courtesy of Dr. Curtis. I tried the emulsion in pronounced cases of middle-ear suppurations. Among the series of cases, there were cases of bone necrosis; cases wherein the disease was limited to the mucous membrane of the middle ear spaces; and cases wherein suppuration had persisted in the tympanic orifice of the Eustachian tube after the radical mastoid operation. The treatment by the emulsion showed no visible effect in six of the middle ear suppurations, including all varieties of cases, and in two of the cases a general infection of the external ear was produced which was finally brought under control by antiseptics. The cases under my care were too few to warrant general conclusions, but my impression of the treatment is distinctly unfavorable to the use of the bacillus in suppurations of the mucous membrane of bony cavities. To try to treat bone necrosis and attempt to cure it by this means is illogical and unsurgical. On the other hand, the two cases among this small number, eight, which developed a general infection, seem to show that the treatment is not to be considered an altogether harmless measure which we can promiscuously employ."

Dr. Curtis said that he had found in several experiments on his cases that a too frequent use of the preparation was bad. Too much lactic acid is secreted, thereby producing a smarting and burning sensation with hyperemia. Every other day in some cases is better than every day, even in cases of ozena. He thought it very unsurgical to smear the solution on the crusts, for all know that the source of infection is under the crusts in the tissues beneath. It is very important to remove the crusts before using the culture, nothwithstanding that there is a certain amount of solution of the crust by the application. The fact that but few experiments have been made in regard to the different kinds of bacteria which this agent destroys may be explained by stating that all the specimens which had been sent to be analyzed containing numerous bacteria before the experiments, came back with the report of no bacteria whatever after the experiments had been concluded. Very few cases, however, have been examined. Of course, this method of treatment is yet in its infancy, but the results are generally favorable, and it seems to be worth while to try it.

Dr. Douglass inquired whether the percentage of the lactic acid contents of the culture had been estimated.

Dr. Curtis replied, 2.1 percent of simple lactic acid.

Presentation of Chisel and Combination Instrument. By J. H Abraham, M. D.

DISCUSSION.

Dr. Emil Mayer said that he trusted the instrument was not intended to supersede Dr. Abraham's excellent little septal knife, presented some time ago, and which he has found to be a very good knife indeed. The latter has an innocent look, and if he wanted to remove a small piece of cartilage without exciting the patient's fear it could be easily done with it, after thorough cocainization.

Dr. Simpson said that he would like to add a good word to what Dr. Mayer had already said. Dr. Abraham's knife was one of the best he had seen, and he had often used it in the way mentioned by Dr. Mayer.

Submucous Knife. By John Waite Avery, M. D.

This knife was devised for the initial incisions of the mucoperichondrium and cartilage of the nasal septum in submucous resections of the same for deflections. The importance of these incisions, and the difficulty of controlling depth of cut, are the reasons for a special knife. The credit of first introducing a knife. with an adjustable blade set in a bend at an angle of 54 degrees from the handle, belongs to Dr. John McCoy.

By setting the blade at a depth corresponding to the thickness of the tissues to be cut there is less danger of an anterior perforation of the septum resulting from the operation, while the angulated head removes the hand from obscuring the field of operation, and gives better control of the knife. There are several special features in this knife. A long blade which is quickly adjusted by a screw varies the depth of the cut from 1/32 to 1/4 of an inch. This large blade is much more easily handled than a very small one, which is apt to be bent or broken, and is difficult to sharpen. The indicator registers depth of cut, which is of practical importance. It is made in three simple pieces and is easily taken apart, cleaned, sterilized and assembled.

Dr. Avery's ideas were carried out by the Kny-Scheerer Company, who have produced an instrument which is a model of workmanship, is neat in appearance, light, well balanced, and has proved very serviceable.

Dr. McCoy said that he would like to make a suggestion in reference to this knife. In doing the operation he had found it advisable to use two blades, one a sharp one for making the incision in the muco-perichondrium, and the other one dull, for making the incision through the cartilage. By using a dull blade one can absolutely avoid wounding the membrane of the opposite side.

The Radical Mastoid Operation for Chronic Suppurative Otiiis Media. H. W. Loeb. *St. Louis Med. Review*, Jan. 19, 1907.

This paper was read as part of a symposium at the St. Louis Medical Society, October 27, 1906. Its main feature was the presentation of preparations made by Dr. Clarence Loeb, showing the various steps of the operation.

Space does not permit a description here of these preparations, but the author's remarks on dressing and the nature of the surgeon's task are particularly worthy of brief quotation.

"Otologists," he writes, "are gradually giving up the old-time method of tightly packing the wound after operation. . . The possibility of delay and complication in healing is greatly lessened, while epidermization is greatly promoted by the plastic methods used and by skin grafting judiciously undertaken."

Various methods of after treatment have been devised; commonly dry boric acid, the cigarette drain, and the rubber tube with spiral cut.

Loeb considers the operation a serious task, requiring great care, skill, and judgment, involving danger to life and to important structures. Eaton.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, October 13, 1908.

A. H. ANDREWS, M. D., President.

Dr. Jos. C. Beck reported the following cases:

Cyst of Epiglottis; Foreign Body in Left Bronchus; Ranula; Paraffinoma.

(To be published in full in subsequent issues of THE LARYNGOSCOPE.)

DISCUSSION.

DR. A. H. ANDREWS: I know positively that some varieties of glass throw a shadow under the Roentgen ray, although it is only glass that contains lead. I would like to ask Dr. Beck whether he knows of any authentic report of malignancy following the injection of parafin. I know of none.

DR. J. HOLINGER: A man came to me with trouble somewhat similar to Dr. Beck's case, following the injection of paraffin. He had had a suppuration of the lachrymal tract, for which a physician injected paraffin with the hope of effecting a cure. The paraffin miscarried and went into the lower eyelid, causing an ugly looking sausage-shaped tumor. I did not treat the patient, but advised the use of dry heat and massage.

DR. G. P. HEAD: I have cut into such paraffin tumors and had no trouble in squeezing out the mass. No scar was produced. As to malignant degeneration in these cases, I have watched the literature rather closely and have not seen any such cases reported.

DR. JOS. C. BECK (closing the discussion): The matter of malignancy is the particular point I wish to bring out in connection with paraffinoma. Kirchner has written more on that subject than anyone else, and he has seen this spindle-celled formation around the paraffin. Every foreign body becomes encapsulated, but, if it is paraffin, the connective tissue always traverses the masses of it, giving us the appearance of a lipoma. There has been no post-mortem report, but cases of metastasis have been reported by Kirchner. I know of only one reported death following the use of paraffin, that of Pfannenstiel, who injected paraffin in a case of incontinence of the rectal sphincter.

In order to make glass stronger, lead is incorporated with it, and that is why glass throws a shadow under the Roentgen ray. Glass that does not contain lead will not throw a shadow.

Abscess Cavity Extending Over Middle Ear, Parotid Gland, Tonsils, Etc. Operation. Recovery. Nasal Tumor (Tuberculoma) for Diagnosis. By J. Holinger, M. D.

Mr. P. is a Pole 23 years of age, tall and strongly built. The first time I saw him he had an expression of suffering, was breathing laboriously, and held his head inclined to the right. On that side of the neck there was a high, cylindrical swelling extending upward in front and in back of the ear, and downward to about one and a half or two inches from the clavicle. Thin pus admixed with black crumbs was running from the ear in considerable quantities, so that the cotton had to be changed every few minutes. The canal was nearly swollen shut. The flow increased on pressure below and in front of the auricle. Little pain was felt on pressure behind the ear. He could open his mouth only very slightly; the right tonsil and soft palate filled the whole pharynx, and both were red and swollen. The uvula and the left palate were in the left corner, where there was also a small breathing space. An incision in the soft palate revealed pus of a similar character as that from the ear,—thin, transparent, mixed with black crumbs of necrotic tissue. From the mouth and the ear a strong odor of fecal matter was evident. There was a very indefinite history of a trauma.

The form and location of the swelling might have suggested the diagnosis of "Bezold's mastoiditis." Still there were many points against it. At the operation the next day we found the bone very hard and thick, containing no cells. Six gouges were spoiled, either chipped or bent before we reached the antrum, which was very small, of about the size of a navy bean and filled with thin pus. No cholesteatoma or cholesteatoma membrane was found. One centimeter below the tip of the mastoid the knife opened an abscess cavity. Several lumps of black necrotic tissue were easily removed with the finger from below and in front of the auricle, probably the necrotic parotid gland. The finger advanced then around the glenoid process of the jaw and entered the mouth close to the previous day's incision between the upper and lower teeth. Behind and medial to the jaw bone, in front of the mastoid muscle the cavity extended into the depth. On account of the many important tissues, however, I did not probe very extensively, contenting myself with repeated syringings with warm boric acid through the external canal, when each time the solution returned in a stream from the depth medial of the angle of the jaw, and simultaneously the patient swallowed several times. There was no excessive hemorrhage. The wound was dressed with iodoform and iodoform gauze. The temperature descended to about 100 degrees, the pulse was always good, 90 to 110. A hearing test before the operation was impossible. Now he hears whispers at several feet, and fork is heard in the right ear, no matter where it is set on the skull.

The tonsillitis disappeared within the next ten days, and the wound made an uneventful recovery within the next three weeks. The only difficulty not yet entirely overcome is the stenosis of the external auditory canal, which has required a good deal of attention ever since the operation. Two points remain to be added as to the operation. It is possible that the mallet which was used had something to do with the breaking of the gouges, as its face was filled with lead. I certainly shall not use such an instrument again.

The second point concerns the opening of the parotitic abscess. No force whatsoever was used in breaking down the septa and removing the necrotic parotid gland so as not to injure any of the large arteries, nor to do more harm to the pes anserinus major of the facial nerve. The avenue around the glenoid process of the mandible was preformed.

Finally permit me to mention that during the last six months this was the third case of inflammation of the middle ear which was operated upon and showed the complication of parotitis. The other two cases were girls of two years who acquired their otitis after infectious diseases, one after scarlet fever, the other after whooping cough. Both children were very emaciated, but improved markedly after the operation. The second child, the daughter of a colleague, ran a temperature for several weeks, combined with temporary retentions of pus on account of periodical closing of the fistula, till finally the father consented to exclude fruit juices from the diet, especially orange juice, which was administered with the intention of inducing bowel movements. In no case, however, was there such extensive necrosis of the parotid gland as in the case first described.

The tissues for diagnostical purposes, which, according to the program, I promised to bring here, are under the miscroscope. They are from the naso-pharynx of a woman of forty years, who has been a mouth-breather all her life. For the last four years swellings developed on both sides of the neck, involving the parotid glands and the lymph glands of the neck. For two years she used X-ray, and several abscesses were opened and curetted. The swellings as a whole are hard-elastic and immovable. The tissues were removed from the naso-pharynx by means of a Gottstein knife. They are adenoid tissues with a great many eosinophile cells, four to six in each field, and the question was raised whether there was Hodgkin's disease. However, no other glands on the body are swollen. The tissues filled the whole naso-pharynx and protruded from the sides as well as from the rear and upper walls. They were covered with a thick layer of infected material. The first few days after the removal the swellings of the glands of the neck diminished perceptibly; later on they increased again. The patient is very emaciated and weak.

It is evident that these are not simple adenoids. Dr. Davis, the pathologist of St. Joseph's Hospital, found tubercles, but another physician insisted that what Dr. Davis called tubercles were simply large lymph vessels. Some parts of the glands make the impression of a sarcoma. Syphilis is not to be excluded, but the patient went through a great deal of antisyphilitic treatment without influence either on the swellings in the naso-pharynx or of the cervical glands.

DISCUSSION.

Dr. Jos. C. Beck: Every once in a while a case of tuberculosis of the adenoids is reported, and no doubt such reports would be more frequent if we should examine every adenoid that is removed. But I think that Dr. Holinger's case was one of an inflammatory mass, a small-cell infiltration and not a malignant tumor or tuberculoma. The duration of the case would preclude sarcoma.

Dr. A. H. Andrews: I would like to ask Dr. Holinger why he holds the lead hammer responsible for the breaking of his chisels. I have used all kinds of hammers, including the lead hammer, and never found that any one of them broke the chisels more often than another.

Dr. J. Holinger (closing the discussion): I saw several of those so-called tubercles in the tissues I examined, and thought I was convinced as to the nature of the trouble. The great number of eosinophile cells points to the serious nature of the infection and to its long standing.

As to Dr. Andrews' question, I think that the absence of resiliency in the lead hammer might account for the chisels breaking. It certainly was very annoying to have to pick out the pieces of steel every time a chisel broke.

The diagnosis of Bezold's mastoiditis was excluded because there were no cells at all. The result of the syringing suggested fracture of the external meatus, but may as well have been due to a dehiscence of the bone in the floor of the meatus.

Case of Cholesteatoma Causing Erosion into the Horizontal Semi-Circular Canal. By Geo. E. Shambaugh, M. D.

Dr. Shambaugh reported a case of cholesteatoma causing an erosion into the horizontal semi-circular canal, and discussed briefly the methods for examining the vestibular apparatus. The case was that of a man fifty-nine years old, who eleven years previous had had a purulent discharge from the right ear, which lasted for several weeks. For several years past he has been annoyed with an accumulation in the canal of the right ear, which he supposed was caused by wax. In attempting to remove this with a hair-pin he had set up a marked dizziness and nausea. The mass proved to be a cholesteatoma protruding into the meatus from an opening in the upper posterior wall, which led directly into the antrum. The membrana tympani showed maceration and thickening, but did not appear to be retracted or perforated. There was a quick response upon syringing the ear with water only slightly colder or warmer than the body temperature. This response was in the character of a nystagmus and pronounced vertigo. On compressing or rarefying the air in the external meatus by means of the Siegel speculum, even the slightest change in pressure resulted in nystagmus and vertigo. The functional examination showed considerable deafness, more marked for the lower tones, with only a slight defect for the highest notes of the Galton whistle. The Weber was distinctly lateralized to the affected ear, and the Rinne was negative.

From these symptoms the diagnosis of an erosion into the horizontal semicircular canal was made, the erosion having made an opening only through the bony capsule, but not through the endosteum. The slight amount of pressure necessary to produce the nystagmus and vertigo in this case shows how very delicate and sensitive is the adjustment of the terminal apparatus in the ampullae.

Dr. Shambaugh discussed three methods of testing the excitability of the vestibular apparatus. All of the methods are dependent upon producing a motion in the endolymph of the semi-circular canals. In the first method, that of the rotating chair, if the semicircular canals are normal and the individual is rotated toward the right, for example, there will be produced a nystagmus toward the right. If the rotation is kept up long enough, all sense of turning, as well as the nystagmus, will disappear. If the rotation is suddenly stopped, a sense of vertigo is produced, and there will be a return of the nystagmus, but directed toward the left. These phenomena can readily be accounted for by the production of a motion in the endolymph of the horizontal semicircular canals. The reason why the sense of turning and the nystagmus disappear after the rotation is discontinued for some time is explained by the fact that the fluid in the semi-circular canals has taken on the motion of the walls of the canal, and, therefore, does not impinge upon the cupula in the crista ampullaris. The production of vertigo, and the nystagmus directed towards the opposite side upon suddenly stopping the turning, is explained by the continuation of the flow in the endolymph of the canals for some time after the turning has been stopped.

The second method of producting a flow in the endolymph of the semi-circular canals was the one used in this case in demonstrating the erosion into the horizontal canal. It consists in the production of either pressure or suction of the air in the external meatus. If an opening exists through the bony capsule of the canal, the endolymph will be caused to flow in this or that direction, depending upon whether suction or pressure is used.

The third method of testing the semicircular canals is that elaborated by Barany, and consists of syringing the ear with hot or cold water. If the vestibular apparatus is intact, symptoms of vertigo and nystagmus can be produced by the use of either hot or cold water. In a case where the semicircular canals are not affected, the reactions obtained are as follows: Syringing with cold water produces a nystagmus which is more pronounced when the eyes are directed towards the opposite side. Syringing with warm water will produce a nystagmus more pronounced when the eyes are directed towards the same side. The vestibular apparatus may be placed in a state of hyperexcitability as the result of irritation, such as may occur from circumscribed suppuration of the labyrinth. Under these circumstances the normal reactions upon syringing with hot and cold water can be obtained. In addition, however, there will frequently be present a spontaneous nystagmus directed toward the affected side.

When the vestibular apparatus is destroyed, no reactions can be obtained by any of the methods for stimulating this part of the internal ear. If the destruction of the nerve-endings in the internal ear has been a sudden one, there will be present for a short time a nystagmus toward the normal ear, which has its origin in this ear, and not in the affected one. Disease of the cerebellum, such as tumor or cerebellar abscess, may produce the same symptoms as occur from irritation of the nerve endings in the vestibule,—that is, a spontaneous nystagmus directed toward the affected side. One can readily see how this study of nystagmus, both spontaneous and induced, is of great value in the diagnosis not only of diseases of the labyrinth, but of such conditions as cerebellar abscess and cerebellar tumor.

DISCUSSION.

DR. J. HOLINGER: Of course, the question is, Can we apply these tests in the office? Everybody does not have a gyroscope. The use of hot and cold water is also very practicable in a hospital where you have plenty of assistance, but in an office, where the operator is alone, the procedure is a very dangerous one because the patient may fall. I use cool and warm water and get the same reaction. Letting the patient hop back and forth with the eyes closed is a good and safe test. However, Dr. Shambaugh has gone over the ground very thoroughly, and we ought to welcome his thorough explanation.

DR. JOS. C. BECK: Dr. Holinger's remarks might be taken as underestimating the value of the methods described by Dr. Shambaugh. I think that this is one of the best things we have learned,—the diagnosis of labyrinthine disease by means of hot and cold water. all the credit being due to Barany. Look out that the patient does not fall. I have used the method in my office with satisfaction. Of course, one would not inject water into an ear that had been suppurating and then became dry, except for diagnostic purposes.

DR. F. ALLPORT: This is a most valuable method for diagnosticating labyrinthine disease. Last year I spent a few weeks in Vienna. Barany's tests were made on every suspicious case that was admitted into the Politzer ear clinic. They all use them and depend on them. and we cannot afford to ignore the judgment of men of such experience. It is the simplest, easiest and best method for diagnosticating labyrinthine disease at our disposal. Dr. Holinger's objections are inconsequential and do not militate against the value of the tests.

DR. A. H. ANDREWS: I have been doing some work on the ears in relation to dizziness, and I feel that there are still many things to learn about vertigo. I have experimented with moving objects before the eyes and find that dizziness can be produced very readily. That is in line with some theories, particularly the one that there is a center in the floor of the fourth ventricle which receives filaments from the eye and ear and the gastro-intestinal tract, and that irritation from any one of these localities produces dizziness, and I think that each one of us carries out experiments in this direction so far as is possible.

Foreign Bodies in the Larynx. A. Canepele. *Revue Heb. de Laryngol., d'Otol. et de Rhinol.*, Oct. 26, 1907.

The first case reported was a little girl of three months. One day the mother found her in her cradle making efforts to vomit, at the same time noticing that the little earring of the child was missing. For four days there were nightly difficulties of respiration, a light wheezing accompanying the respiration. As laryngoscopy with a mirror could not be performed, a digital examination was made and showed the presence of a foreign body in the larynx. The introduction of laryngeal forceps resulted on the third attempt in the removal of the missing earring, which had become attached to the right vocal cord.

The second case was a child of nine months which, while playing with a chicken bone, placed it in its mouth, and had a sudden attack of suffocation. The attack became less severe, but returned so severely that a rapid tracheotomy had to be done. A radioscopy was made without effect. A digital examination of the larynx indicated the presence of a hard, immovable body attached to the left side. A laryngo-fissure was made and a triangular piece of chicken bone extending obliquely across the glottic opening was found.

From these cases, the author concludes that especially in little children, a digital examination is a good means of diagnosing foreign bodies in the larynx, and that laryngo-fissure is the best procedure in these cases Scheppegrell.

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